O.S.

How Americans Sell Abroad
("Marketing")

International Management Digest®

AUGUST 1960
ONE DOLLAR

THE McGRAW-HILL PUBLICATION OF WORLD BUSINESS INFORMATION

A skillful people is pushing Japan to the forefront of electronics. ("Industries")

PIAZZA SAN MARCO, VENICE. THE CITY HAS TWO BANCA D'AMERICA E D'ITALIA BRANCHES.

man-on-the-spot *in Venice*

This Bank of America executive knows Venice like his own home town. Experience has taught him where, when and how to get things done.

How can he help *you*, exactly? By supplying market data. Credit information. Business contacts. By putting at your disposal the knowledge that only a man-on-the-spot is qualified to provide.

Global in scope, our International Banking Organization can put other such specialists to work for you in leading trade centers the world over. If your business abroad calls for the services of a man-on-the-spot, just give us a call.

OVERSEAS BRANCHES: London • Manila • Tokyo • Yokohama • Kobe • Osaka • Bangkok Guam • Okinawa; REPRESENTATIVE OFFICES: New York • Washington, D. C. • Chicago Mexico City • Havana • Rio de Janeiro • Buenos Aires • Lisbon • Milan • Zurich • London • Paris Duesseldorf • Beirut • New Delhi • Tokyo; BANK OF AMERICA (International) — a subsidiary: New York Guatemala City • Paris • Duesseldorf • Hong Kong • Singapore • Kuala Lumpur • Beirut; BANCA D'AMERICA E D'ITALIA: over 60 Branches throughout Italy; CORRESPONDENTS WORLD-WIDE

BANK OF AMERICA

NATIONAL TRUST AND SAVINGS ASSOCIATION • MBR. F.D.I.C.
HEAD OFFICES: SAN FRANCISCO 20 • LOS ANGELES 54
BANK OF AMERICA (INTERNATIONAL) NEW YORK CITY 5

INTERNATIONAL MANAGEMENT'S

American Letter

August 1960

WORLD BUSINESS CANNOT EXPECT MUCH NEW STIMULUS FROM THE U.S.A. THIS YEAR. On the contrary, American business hopes for a continuing fillip from abroad--mainly in the form of rising exports, most of them bound for Western Europe.

U.S. business moved into second-half 1960 on a high plateau, prices steady to weak, and no strong upward or downward movement in sight. It has been a problem getting production into balance with consumption--steel and appliances are examples. But while steel output should pick up this month (for the start of 1961 auto production), no one can guess how the consumer will behave, though his pocket is bulging. The latest survey of consumer confidence and intentions to buy durable goods, released in July, was not at all encouraging.

An important trend here: Increases in personal income are more and more soaked up by higher costs of services, and purchases of additional services. Thus a rise in American living standards is not wholly reflected in higher purchases of goods. (Who needs a third car in the family, or another TV?)

THE U.S.A. IS HAVING ITS BEST FOREIGN TRADE YEAR SINCE RECORD 1957. Exports are up over 20%, imports hardly at all. The export gain is due largely to good business in Europe. And note that relaxation of restrictions on dollar imports is having a remarkably expansive effect: Sales of U.S. consumer goods to nations that have reduced restrictions jumped 80% or so in the early part of 1960.

Despite the promise of a substantial surplus of exports over imports, the U.S.A. will still run a big deficit in its dealings with the world in 1960. For one thing, there will be a continuing high level of foreign aid spending. For another, easier money in the U.S.A. and tighter money in Europe is increasing the outflow of dollars from the U.S.--another offset to the trade surplus.

Note: Any slackening in European business could cut deeply into U.S. sales there. And in early July, there were signs of just such a slowing-down in Britain, as government moved to restrain the business boom there.

A CHANGE IN U.S. POLICY TOWARD EUROPE'S TWO TRADE BLOCS? The State Dept. has been quite content that EEC and EFTA were unable to come together (page 15). Washington has favored the Six over the Seven, for political reasons and because it feared a wider trading arrangement would increase the area of discrimination against U.S. goods. But some powerful officials disagree with this policy, as do many businessmen. All believe it only a matter of time before the two blocs merge.

Next year will be the testing period. You may see the U.S. trying to bring France and Britain to a satisfactory compromise. France will have to accept the fact that if the British show real accommodation, France cannot have the European Economic Community on its terms alone--and expect U.S. backing too.

American Letter

LETTER FROM CHICAGO: "I've never seen so many businessmen from abroad," says a Chicago executive. "They are coming through by the thousands, wanting to know all about the market here." His comment is typical of what is happening in the U.S.A.'s second city, once the center of anti-foreign, "isolationist" sentiment in America.

Chicago is import-minded now. European cars crowd the Lake Shore Drive; shop windows are crammed with radios, clothes, sporting goods, housewares from abroad; specialized industrial imports find ready buyers. Thousands of Chicagoans went to the city's second world trade fair this summer. And there are suddenly two proposals to build international office and exhibition buildings in the downtown "Loop."

"We've just assigned a man full time to handle inquiries from foreign banks on behalf of their customers," says a banker. Another confides that he is working on a scheme to promote the city (and his bank) directly in foreign cities.

THE ST. LAWRENCE SEAWAY IS PARTLY RESPONSIBLE FOR THE CHANGES. This, despite the fact that Chicago's first year of handling ocean ships did not turn out well. Port efficiency was low, and last year's inflow of foreign steel (owing to the strike) confused matters. Yet cargo increased threefold 1958-1959.

Chicago manufacturers are themselves internationalizing. Not only are they buying more abroad, but they are expanding their own companies' foreign operations. Where you once heard Chicago executives shouting for tariff protection, they are now talking about their next trip overseas in search of new business.

CHICAGO IS A MIGHTY MARKET, BOOMING AS NEVER BEFORE. City population is 4-million or so, nucleus of an exploding metropolitan area of some 7-million. During the 1950s, nearly $3,250-million was invested in new industrial plant and equipment; in the 1960s, economists expect another $5,000-million if Chicago is to keep up. And note that Chicago's market influence reaches out to cover the entire farm and factory heartland of the nation. (Chicago wholesalers did $23,600-million worth of business in 1959, about 15% of the national total.)

Chicago is a different market than it was a generation ago. The famed meatpackers have gone, replaced by a more healthy diversity of industry. Chicago is the Number One U.S. steel producer, yet the voracious appetite of its thousands of metalworking firms make it a steel deficit area. Three of the top five radio-TV makers are here, along with hundreds of component manufacturers. Chicago leads the country in candy, sporting goods, farm equipment, railroad equipment; it is at the forefront of U.S. printing, food processing, and transportation.

All this makes Chicago a prime market for foreign suppliers. But Chicagoans, piqued at New York's foreign trade leadership, warn: Do not give an exclusive distributorship in the East if you want big business here. Consider the U.S.A. as three markets--the two coasts, and the Mid-West. And that means Chicago.

(Want more information? See your bank or government trade authorities. Or write to Assn. of Commerce & Industry, 30 West Monroe Street, Chicago, Illinois.)

SUCCESS OF COMPACT CARS REVOLUTIONIZES U.S. AUTO INDUSTRY. It's official now: The small-sized Chevrolets, Fords, and Chryslers introduced last year have captured over 20% of new car sales in the U.S.A. so far. And they helped stimulate a 30% rise in American car exports during the first four months of 1960. As a result, September-October production of 1961-model cars may set new records. Note that General Motors and Chrysler will produce four new variations, bringing to ten the number of "compacts."

The entry of more compacts will probably cause many foreign producers to see their U.S. sales decline further. Only Volkswagen and Renault registered gains this year; the rest suffered sharp losses. A possible reaction to the compact success: reports that Volkswagen will build a larger model by the end of 1961.

* * * *

THE BUYER BENEFITS AS U.S. PACKAGING BATTLE GETS HOTTER. Steel, aluminum, plastic, glass container manufacturers are stepping up their competitive struggle. Note the price reductions in tinplate; the giant American Can Co.'s moves into the glass bottle market and Continental Can Co.'s decision to spend $75-million on expansion (mainly in tin cans); predictions by these and other can makers of a 50% gain in their soft drink market; the revelation that plastic container sales in first-quarter 1960 were 25% ahead of last year; the renewed push by aluminum to expand gains in motor oil, fruit juice, aerosol cans.

* * * *

BIG BUSINESS IN THE FERTILIZER TRADE? The U.N.'s Food & Agricultural Organization has launched a five-year campaign to raise world food production through more intensive use of fertilizers. International producers and traders in fertilizers should stand to gain as global consumption starts rising.

Yet some experts voice warnings. Many more nations are building their own fertilizer plants, often with the aid of foreign capital. (For example, there's the news that Mitsui of Japan and Koppers of the U.S. are both going to help put up plants in India.) Moreover, world surplus production of nitrogen materials is rising, with more than 2.25-million tons of nitrogen capacity due before 1965 in major producing and consuming nations. The outlook: More business--but more competition too, possibly with price cuts and some dumping.

NEW & NOTEWORTHY: Smaller, cheaper electrical devices recently have come out of two U.S. laboratories: Sylvania Electric Products offers a transformer for TV sets and computers that is 30% smaller and lighter than conventional designs. General Electric Co. has a vacuum tube called the Compactron that puts the ability of three or four standard tubes in one glass envelope.

Unique feed and film-handling mechanisms mark a packaging machine developed by Hamac-Hansella Maschinen GmbH, Viersen, West Germany, that wraps individual pieces of candy in cellophane at the rate of 470 per minute.

A reconstituted leather, made from a solution of hide solids--inexpensive, uniform, and with the texture and physical characteristics of the natural product--comes from Armour Leather Co. and United Shoe Machinery Corp., U.S.A.

TRENDS OF THE TIMES: Italy's ambitious, fast-growing state petroleum company, ENI, pushes deep into Africa. A refining-marketing-exploration deal with the Tunisian government brings to 11 the African nations where ENI has expanded.

Copenhagen to New York to Bangkok: Denmark's East Asiatic Co. has joined with International Basic Economy Corp., one of the Rockefeller organizations, to set up the Thai Industrial Advancement Co. to help organize and finance new businesses in Thailand....Meanwhile, the Danes are launching a major effort to attract foreign capital to their homeland. American and European investors are being solicited and offered--among other things--attractive depreciation schemes.

Worry about U.S. export competition turned up in London, when S.P. Chambers, new chairman of the giant Imperial Chemical Industries Ltd. (IMD--May,p27), charged that American companies sometimes sell abroad at marginal prices in order to keep plants busy. Chambers thought highly-capitalized industries (chemicals, for example) were the worst offenders, and hinted that Washington's new "export drive" might intensify the situation. (His speech had a familiar ring in the U.S.--where manufacturers have been saying the same thing about foreign competitors for years.)

* * * *

A QUICK REVIEW OF EXCHANGE, CREDIT, AND BUSINESS CONDITIONS

Country	Exchange Rate (units per $1, New York)			Government Reserves (gold & foreign exchange, millions)		Dollars in U.S. Banks	Conversion Delays / Collection Experience		Business Conditions
	6 July, 1960		6 June, 1960	latest month	August, 1959	(Millions)			
Argentina	80.00	Peso	80.00	$ 482.0	$ 188.0	$ 386.0	2 Mos.	Fair-Good	Fair-Good
Australia	• 2.23	Pound	• 2.23	1,226.0	1,157.0	140.0	None	Very Good	Good
Austria	25.31	Schilling	25.31	640.0	754.0	234.0	None	Good	Good
Belgium	50.00	Franc	49.26	1,330.0	1,421.0	136.0	None	Very Good	Good
Bolivia	12,000.00	Boliviano	12,000.00	10.1	8.4	19.9	3 Mos.	Fair-Poor	Fair-Poor
Brazil	185.00	Cruzeiro	180.00	390.0	473.0	159.0	3 Mos.	Fair-Good	Fair-Good
Canada	.9804	Dollar	.9804	1,748.0	1,932.0	2,384.0	None	Very Good	Very Good
Chile	1.05	Escudo	1.05	124.4	127.8	146.7	2 Mos.	Good	Fair-Poor
Colombia	6.80	Peso	6.66	199.0	207.0	205.0	2 Mos.	Good	Good
Costa Rica	6.67	Colon	6.67	16.3	22.4	18.9	1 Mo.	Good	Good
Cuba	1.80	Peso	1.80	342.0	313.0	146.0	3 Mos.	#L/C Basis	Poor
Denmark	6.80	Krone	6.80	237.7	249.7	92.1	None	Very Good	Good
Dom. Rep.	1.01	Peso	1.01	43.2	42.1	29.4	None	Very Good	Good
Ecuador	16.67	Sucre	16.67	41.0	36.0	21.7	1 Mo.	Fair-Good	Fair-Good
El Salvador	2.50	Colon	2.50	41.4	38.2	33.1	1 Mo.	Fair-Good	Good
Finland	312.00	Markka	312.00	287.6	290.2	75.2	None	Good	Fair-Good
France	4.85	Franc	4.86	2,026.0	1,875.0	711.0	None	Good	Good
Germany	4.15	D-Mark	4.15	5,404.0	5,402.0	2,199.0	None	Very Good	Very Good
Greece	27.80	Drachma	27.80	232.0	183.6	145.9	1 Mo.	Fair-Good	Fair-Good
Guatemala	1.01	Quetzal	1.01	55.5	43.9	94.0	1 Mo.	Good	Fair-Good
Honduras	2.00	Lempira	2.00	12.7	16.7	12.8	1 Mo.	Fair-Good	Improving
India	6.67	Rupee	6.67	609.0	632.0	68.0	1 Mo.	Good	Good
Indonesia	200.00	Rupiah	200.00	370.0	199.0	152.0	--	#L/C Basis	Poor
Iran	76.92	Rial	76.92	201.00	226.0	39.0	3 Mos.	Fair-Good	Good
Iraq	• 2.70	Dinar	• 2.70	342.6	319.9	18.0	2 Mos.	#L/C Basis	Fair-Good
Israel	2.50	Pound	2.50	182.7	132.7	93.4	1 Mo.	#L/C Basis	Good
Italy	615.00	Lira	615.00	3,313.0	2,978.0	1,142.0	None	Very Good	Good
Japan	385.00	Yen	377.00	1,321.0	1,209.0	1,379.0	None	Good	Good
Mexico	12.35	Peso	12.35	406.0	397.0	437.0	None	Good	Very Good
Netherlands	3.74	Guilder	3.74	1,397.0	1,384.0	442.0	None	Very Good	Good
New Zealand	• 2.60	Pound	• 2.60	282.0	288.0	7.0	None	Very Good	Good
Nicaragua	8.00	Cordoba	8.00	15.4	17.3	12.5	None	Very Good	Good
Norway	7.04	Krone	7.04	281.7	227.8	96.1	None	Very Good	Fair-Good
Pakistan	6.80	Rupee	6.80	304.0	276.0	23.5	2 Mos.	#L/C Basis	Fair
Panama	1.00	Balboa	1.00	40.0	45.7	129.*	None	Very Good	Good
Peru	26.66	Sol	26.66	47.1	35.0	8.5	1 Mo.	Good	Improving
Philippines	3.64	Peso	3.64	127.0	78.0	184.0	1 Mo.	#L/C Basis	Fair-Good
Portugal	27.40	Escudo	27.40	787.0	795.0	113.0	None	Very Good	Good
South Africa	• 2.77	Pound	• 2.77	366.0	371.0	39.0	None	Very Good	Good
Spain	59.75	Peseta	59.75	54.0	57.0	108.0	--	#L/C Basis	Fair
Sweden	5.13	Krona	5.13	445.0	486.0	265.0	None	Very Good	Good
Switzerland	4.29	Franc	4.29	1,899.0	2,015.0	927.0	None	Very Good	Very Good
Turkey	12.50	Pound	12.50	273.0	277.0	23.0	--	#L/C Basis	Fair
U. A. R.	• 2.10	Pound	• 2.10	274.0	382.0	39.0	--	#L/C Basis	Fair
U. K.	• 2.8150	Pound	• 2.82	2,892.4	3,248.0	1,310.0	None	Very Good	Good
Uruguay	11.11	Peso	11.11	180.0	180.0	62.0	2 Mos.	Poor	Fair
Venezuela	3.34	Bolivar	3.34	692.0	948.0	317.0	1 Mo.	Fair-Good	Good

*U.S. Dollars per Pound. #Most Exports by Letter of Credit

The Editors

Volume 15, Number 8 of INTERNATIONAL MANAGEMENT DIGEST, published monthly by McGraw-Hill International Corp., 330 West 42nd Street, New York 36, N. Y., U.S.A. Subscriptions solicited only from management executives in business and industry. Subscription price $5 (U.S.) for one year. Publication office: 99-129 North Broadway, Albany 1, New York. Second class postage paid at Albany, New York, INTERNATIONAL MANAGEMENT DIGEST and AMERICAN LETTER copyright© by McGraw-Hill International Corp., 1960.

Sound footing

Today clogs are mostly worn for the eagerly-snapping cameras of tourists. Even to Grandfather they are only a memory. His choice, like everyone else's, is for a more supple kind of footwear . . . something of leather, rubber or canvas that bends with the foot. And, if the shoe bends, so must the adhesive in it. It must bend without breaking . . . yet still stick tight.

Such adhesives are based on rubbers, often dissolved in MEK (methyl ethyl ketone). In all these adhesives the solvent used plays a vital part in their successful application and methyl ethyl ketone, one of the ketones made by Shell, is highly effective for this and many other uses. Shell ketones are stable in the presence of water and can often be diluted with hydrocarbons—all helping to cut down the cost of solvent and extraction processes.

Shell industrial chemicals are helping industry throughout the world in other ways too numerous to mention. The advantages of a world-wide production backed by the finest research available are yours when you deal with Shell. The best of additives, detergents, solvents, plastics, synthetic rubbers and base chemicals today come from Shell. Your Shell Company will be pleased to give you full details.

Shell Ketones

Issued by Shell International Chemical Company Limited.
For further information apply to your Shell Company.

YOU CAN BE SURE OF SHELL CHEMICALS

SHELL

AUGUST 1960

VOLUME 15 NUMBER 8

International Management Digest.

WORLD BUSINESS

EFTA: Will the New Bloc Last? Europe's "Free Traders" get away to an uncertain start.....15

The Money Is Available—but Sound Projects are Not. New light on the "capital shortage".....16

Any Hope for Shipping? Modernization goes on, despite an alarming surplus of ships.....18

Currencies: A 10-Year Record. Bankers' report points up the fight against inflation.....19

MANAGEMENT METHODS

A Yank Buys in Britain, Europeans Buy in the U.S.A. Two case histories in overseas control..21

How Data Processing Benefits the Small Firm. Aids to sales, production, inventory control....22

What It Takes to Get on with the Job. An expert looks at the causes of "executive failure".....26

MARKETING

Americans Abroad: Accent on Marketing. How the Yanks go about exporting goods and services...28

TECHNOLOGY

Scrap Earns Extra Dividends. How to get value out of waste metal, paper, plastics.....39

New Designs Combine Function and Sales Appeal. Design winners each satisfy a basic need.....40

Mandrels Dissolve from Odd Shapes. New technique melts mold away from its intricate part..42

Using the Earth's Heat. Geothermic power plants supply electricity for four countries.....46

Plastic Foams Find New Uses. Urethane has been joined by styrene—in furniture, toys, packaging. 49

In Brief. News about gasification, explosive forming, auto exhausts, machines that hear.....49

INDUSTRIES

Electrons Build a New Japan. A skillful nation makes a determined bid in world electronics...53

DEPARTMENTS

Readers' Page 8

Business at a Glance.....11

Product Digest 57

Recommended Reading 63

Personal Business 64

E. E. WEYENETH, *Publisher*

PAUL R. MILLER, JR., *Editor*

Associate Editors

Alfred E. Lewis
Laurence M. Schmeidler
Thomas B. Winston

Editorial Assistants

Irma Dunay
Irene Papangelou
Gilda M. Roberts

Dexter Keezer, *Director of McGraw-Hill Economics Department*

John Wilhelm, *Director of News Bureaus*

NEWS BUREAUS

B. E. Barnes, *Atlanta*
O. M. Marashian, *Beirut*
Morrie Helitzer, *Bonn*
John Pearson, *Caracas*
Stewart Ramsey, *Chicago*
Donald MacDonald, *Detroit*
John Shinn, *London*
Kemp Anderson, *Los Angeles*
Alicja Grobtuch, *Melbourne*
Peter Weaver, *Mexico City*
Ernest Conine, *Moscow*
Robert E. Farrell, *Paris*
Leslie Warren, *Rio de Janeiro*
Jenness Keene, *San Francisco*
Sol Sanders, *Toyko*
George B. Bryant, *Washington*
Correspondents in 45 other cities

R. H. Larsen, *Advertising Sales Manager*

Angelo Minerva, *Production Manager*

INTERNATIONAL MANAGEMENT DIGEST

INTERNATIONAL MANAGEMENT DIGEST (formerly McGraw-Hill DIGEST; Overseas and Latin American Editions is published monthly by McGraw-Hill International Corporation. James H. McGraw (1860-1948) Founder. Circulation in all countries of the world except the United States and Canada.

Executive, editorial, advertising and circulation office: 330 West 42nd Street, New York 36, N. Y., U. S. A. Donald C. McGraw, Chairman of the Board; Nelson L. Bond, President; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Vice-President and Treasurer; John J. Cooke, Secretary; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator.

Publication Office 99-129 North Broadway, Albany 1, N. Y., U. S. A. See panel below for directions regarding subscriptions or change of address.

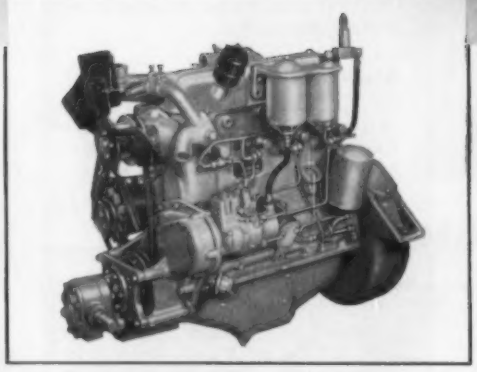
Subscriptions may be ordered through Fulfillment Manager (See Below). Subscriptions to INTERNATIONAL MANAGEMENT DIGEST are solicited only from management men in business and industry. Subscription orders must indicate position and company name. Subscription rate $5.00 for 1 year, single copies $1.00 (U. S. currency). Second class postage paid at Albany, New York. Printed in U.S.A.

© Copyright 1960 by McGraw-Hill International Corporation. All rights reserved. Reproduction of items in full or in part without written permission prohibited in all parts of the world.

Our primary aim is to provide subscribers with a useful publication. Your comments and suggestions for improvement are encouraged. The publisher, upon written request from any subscriber to our New York office, agrees to refund he part of the subscription price applying to copies not yet mailed.

Send Subscription correspondence and change of address to Fulfillment Manager, INTERNATIONAL MANAGEMENT DIGEST, 330 West 42nd Street, New York 36, N. Y., U.S.A. For change of address please mail your complete new address as well as clipping of the old envelope showing your old address.

Audit Bureau of Circulations



MONEYSAVING ECONOMY

with 3 new Allis-Chalmers lift trucks

Allis-Chalmers fork lift trucks have established a reputation among industrial firms for outstanding working ability, fuel economy and low maintenance costs. Now three new models have been added, powered by an Allis-Chalmers diesel engine of exceptional power and efficiency.

The D-175 diesel engine (illustrated above) is a heavy-duty industrial type built especially for fork lift trucks to provide maximum torque at normal operating speeds. It is capable of continuous operation day after day for thousands of hours without major overhaul. Also available with gasoline power.

Following are a few of the superior advantages of Allis-Chalmers lift trucks:

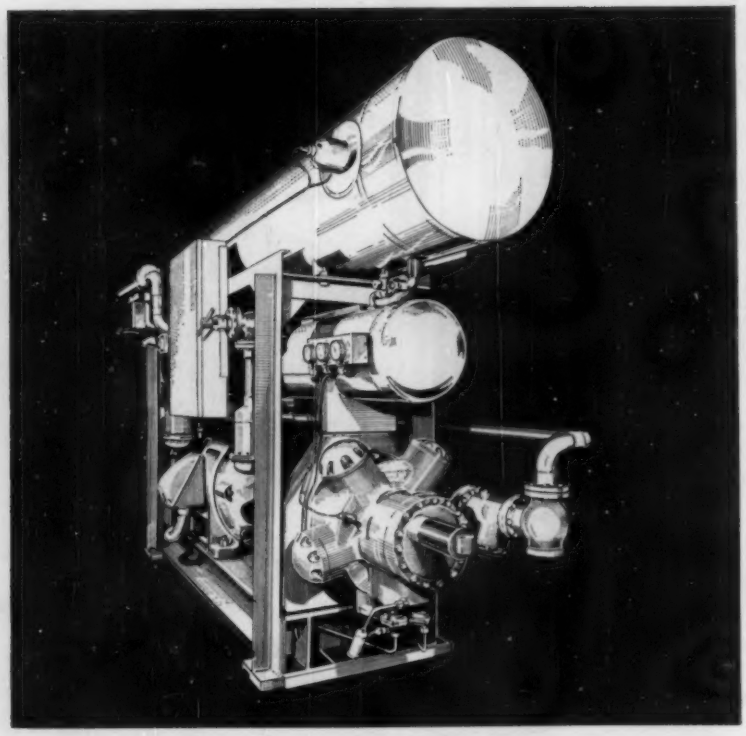
- Power, balance and distribution of weight to climb steep inclines.
- Easy to service. Seat tilts forward to provide access to engine and clutch.
- Easy to drive — increases daily capacity and reduces operator fatigue.
- Replaceable "wet" cylinder sleeves save time and money.
- Pivoted rear axle provides positive traction on uneven surfaces.
- Rugged 2"x5" bar steel, heavy-duty frame.
- Choice of standard or POWER-SHIFT transmission.

For complete information, consult the Allis-Chalmers Material Handling Distributor in your area, or write us.

ALLIS-CHALMERS INTERNATIONAL Department MD860, Milwaukee 1 U.S.A.

BUILDERS OF MACHINERY
SINCE 1847

ALLIS-CHALMERS



For all sizes and types of buildings

CHRYSLER AIRTEMP

a complete range of air conditioning units give cool comfort whatever the climate

For 25 years, Airtemp has pioneered in modern air conditioning - providing the fullest measure of human comfort. Advanced engineering, modern design - in the famous Chrysler Corporation tradition - give you high quality performance, low cost installation and operation. Whether your air conditioning job is as simple as a single office, or as complex as a 25 story building, it will pay to check into the many advantages of climate by Chrysler

Room units from 1 to 2 1/2 HP
Packaged units from 36.000 to 360.000 BTUH
Central Station models from 40 to 100 HP
Centrifugal systems from 150 to 890 tons
Liquid chillers from 7 1/2 to 125 HP

For complete information, contact your Airtemp distributor or write to:

CHRYSLER INTERNATIONAL S.A.
P.O. Box 281 Ginebra-Suiza

CISA - O - A - 4/3

• READERS' PAGE

Don't Forget Portuguese Africa

Sir . . . I am especially interested in the African economic development, and as managing director of Hidro-Electrica do Alto Catumbela—which is handling the electrification of central Angola—and Companhia de Celulose do Ultramar Portugues — now erecting a cellulose pulp and paper mill, also in Angola—I have been in contact with groups that are interested in Angola investments.

In your May article "Business Takes a Careful Look at Africa," references are made about almost all the African territories, population, industrial fomentation, etc.; whereas the only reference made to Angola and Mozambique is that "there is no political trouble there."

The lack of political trouble does not seem to be a reason for omitting some references to these territories in an article that aims to give an idea of the present African situation and its economic possibilities. Both the Portuguese government and national and foreign capitalists are investing big sums in these territories, trying to accelerate the rhythm of their economic development . . . Portuguese territories should be taken into consideration in the general balance of the African possibilities.

Joao Pedro Collares Pereira
Lisbon, Portugal

Brasilia Where It Belongs

Sir . . . Reading your March issue, I have noticed that the map of Brazil (page 13) presents Brasilia in an incorrect geographical position . . . If you will allow me, I attach a little map of Brazil on which you will find the proper geographical position.

Luiz Mourao Rodrigues
Irmaos Lever
Sao Paulo, Brazil

• Somewhere between the Editor's desk and the print shop, Brasilia took to wandering. Our apologies to that fair city, and our thanks to reader Mourao Rodrigues.—EDITOR

Late Report From Honduras

Sir . . . In the June issue, on page 4, you give a "Quick Review of Exchange, Credit and Business Conditions." Let us give you the most recent figures for Honduras' Government Reserves, in million dollars:

May 31, 1959	$15.37
May 31, 1960	$12.74

Arturo H. Medrano
Banco Central de Honduras
Tegucigalpa, Honduras

• Our quotations for government gold and foreign exchange reserves are based on the latest figures reported by the International Monetary Fund. Sometimes they are a few months behind. Thanks to reader Medrano for keeping us up to date.—EDITOR

HITACHI

INSULATION TESTERS

7

Profitable Features!

Consisting essentially of an insulation resistance measuring element and a hand-driven dynamo for current supply, this rugged little unit can be used for testing insulators, cables, electrical instruments and transmission lines. It is designed for voltages ranging from 100V to 2,500V and is available in double-scale type, double-rating type, panel use type, etc. Built in strict conformity to Japanese Industrial Standards (JIS C 1301) and Japanese Export Standards, and guaranteed by the name it proudly bears—Hitachi.

Fast, Accurate Readings: Clear and precise calibrations, a magnified scale and a fast, non-fluctuating needle assure quick and accurate readings under all conditions.

Unaffected by External Magnetic Fields: Internal magnet cross coil system eliminates any error resulting from the influence of external magnetic fields, even when used near a circuit carrying a large current.

High Durability and Efficiency: The use of small, lightweight parts gives the tester a high resistance to vibration and impact, and permits immediate use without time-consuming leveling adjustments.

No Infinity Adjustments Necessary: The high rotating power of movable parts and the adoption of a shielding plate makes infinity adjustment unnecessary, even in High Rating Insulation Testers of the 2,500V 10,000MΩ class.

Full Protection from Dust, Moisture: A sturdily-constructed light metal casing and special seals at all joints afford complete protection from dust and moisture; ensuring continued, trouble-free service.

No Current Leakage Errors: Guard rings for high voltage line terminals prevent any current leakage into the measuring circuits and eliminate any possibility of error.

Light and Compact: Exterior dimensions conform to Japanese Industrial Standards for Small Type Testers but weight has been kept down to 2.5 kg.

Hitachi, Ltd.
Tokyo Japan
Cable Address: "HITACHY" TOKYO

ECONOMY CLASS OR FIRST CLASS

BOAC ROLLS-ROYCE 707 JETLINERS FLY...

Ambassadors excellently

In-laws inexpensively

Tourists thriftily

Mums modestly

Officers obediently

Lecturers attentively

Economists economically

Publishers impressively

New editions nippily

JET RETURN FARES FROM LONDON

NEW YORK	£173 · 13s Economy Class	£321 · 10s First Class
MONTREAL	£163 · 7s Economy Class	£312 · 10s First Class
TORONTO	£174 · 15s Economy Class	£328 · 18s First Class

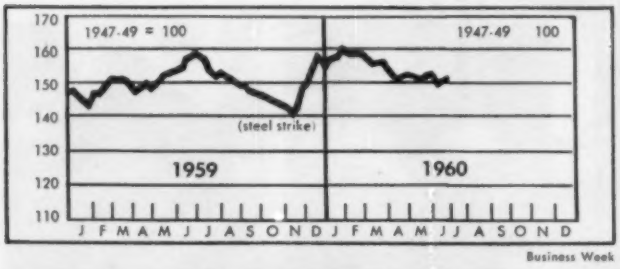
Consult your local Travel Agent or any office of BOAC in the U.K., or BEA in Europe.

B·O·A·C

TAKES GOOD CARE OF YOU

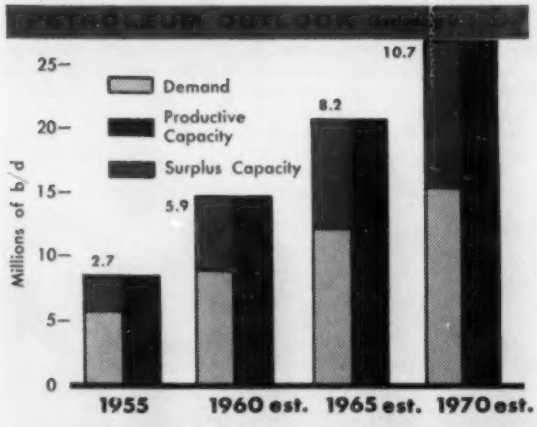
BRITISH OVERSEAS AIRWAYS CORPORATION IN ASSOCIATION WITH T C A, QANTAS AND AIR INDIA

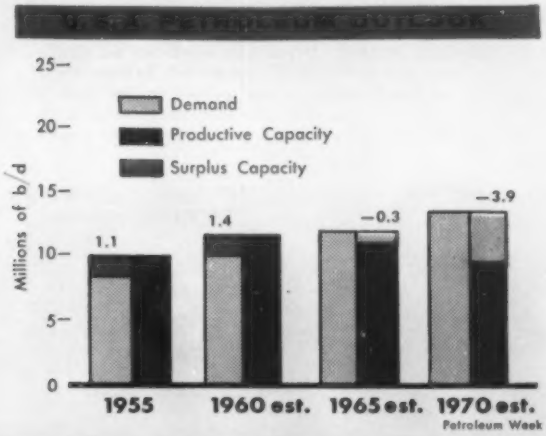
Business at a Glance



U. S. Business Trend

U. S. business is good—but hardly exhilarating. Prices are steady to weak; summer shutdowns have slowed output; consumers are not rushing to buy; some capital spending plans have been cut back. No strong upward—or downward—moves are in prospect. Best guess: The next four months should push the index (left) close to 160, thanks to Detroit's determination to get into '61 production fast.





PETROLEUM: TOO MUCH, FOR MUCH TOO LONG

Detailed studies by the "Forward Planning" staffs of leading international petroleum companies all reach the same conclusion: The buyer's market will not only continue, but will intensify during the next five to ten years.

One study (chart above, left) indicates why. Note how surplus productive capacity in the free world (outside the U. S. A.) already has more than doubled since 1955, and is expected to double again by 1970.

But surplus capacity will not be spread evenly around the world. Take the U. S. A. (chart, right). During the next decade, it is expected to become a "deficit" area.

But this is only a technicality: The U. S. A. will merely draw more and more on overseas sources. *Petroleum Week* explains it this way: "Even under today's import quotas, considerably more productive capacity is closed off within the U. S. A. for lack of markets than the chart would indicate, since part of U. S. demand is already being supplied with imports."

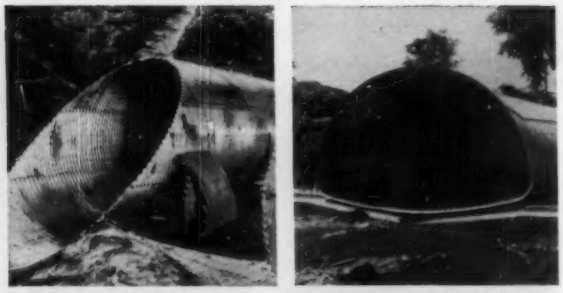
At the same time, the profitability of the established international operations will be affected by: (1) the increase in new sources overseas—with built-in market priorities (France's for Algerian crude; Argentina's for new local production); (2) the increasing number of state-owned companies becoming active in oil exploration and production—all with automatic market priorities (Italy, Egypt, France, Venezuela.); (3) foreign governments also moving into oil refining and marketing operations.

As a result of these factors, *Petroleum Week* draws these conclusions:

- Even if non-U. S. oil demand grows at the rate of 7% annually, the volume of the crude oil outlets of the established international marketing companies is likely to rise at a rate of only 2%-3% per year during the next decade—compared with their growth rate of 9.5% during the past five years.
- About 14-15-million barrels daily minimum supply will be probably taken from preferential sources out of a total free world demand (including the U. S. A.).
- This will leave only some 11-12 million b/d of markets open to free consumption from the major oil export centers.
- These centers—after serving their preferred markets—will have sufficient reserves to build up producibility in excess of 70-million b/d, compared to export markets open to them of only around 11-12 million b/d.
- Even these markets open to them may be substantially reduced by important new successes in importing countries' local exploration efforts, or a further trend toward market-supply orientation through bilateral trade agreements, customs unions, etc.
- Furthermore, by 1970, Russian exports could be a major factor, with one-to-two million b/d possible.

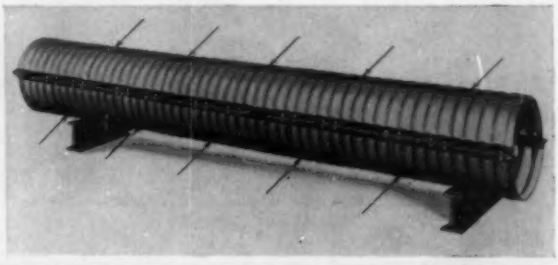
LOW COST REPUBLIC DRAINAGE PRODUCTS to meet every need

SECTIONAL PLATE ARCHES. Durable bridges can be quickly erected at a low cost with Sectional Plate Arches. Sections are of the right size to bolt together quickly without special tools or skilled laborers. Many span and rise sizes are available for different requirements. Ends may be plain, skewed or sloped.



SECTIONAL PLATE PIPE and PIPE-ARCH. Recommended for large drainage structures. Made of rust-resisting galvanized copper steel plates. Easy to assemble and bolt together. Where corrosion is severe, an asphalt coating may be specified. Corrugations are 6 inches (15.2 cm.) from crest to crest, 2 inches (5.1 cm.) in depth. Plain, skewed, or sloped ends.

NESTABLE PIPE-ARCH. Ideal for drainage applications where the vertical dimension is limited. It provides a wide, efficient waterway for fast runoff to keep water level down and reduce ponding to a minimum. Low initial cost, ease of shipping, handling, and installation all combine to make Nestable Pipe-Arch very economical.



NESTABLE PIPE. Strong, durable, safe, and efficient. Lightweight nestable sections are designed for ease of handling, transporting, and erecting. Sections bolt together quickly to save time and labor. Uniformly galvanized on both sides to resist corrosion. From 8 through 84 inches (20.3 through 213.4 cm.) in diameter.

To meet maximum corrosion conditions, Republic also produces drainage structures that are fabricated from asbestos zinc-clad sheets, and asphalt coated.

OTHER REPUBLIC PRODUCTS FOR CONSTRUCTION

LOK-COR SUBDRAINAGE PIPE

TUNNEL LINER PLATES

ROOF BOLTS for tunneling and rock cuts

STRUCTURAL TUBING for bridge railing

Known the World Over for Quality Steels

REPUBLIC STEEL CORPORATION

Export Department: Chrysler Building • New York 17, N.Y., U.S.A.

Cable Address: "TONCAN" • General Offices: Cleveland 1, Ohio

REPRESENTATIVES IN PRINCIPAL CITIES OF THE WORLD

Better RED RING tooling
through intensive research

A new COMPUTER (the latest BENDIX Alpha-Numerical type) has enabled us to greatly accelerate our continuing program of basic research in both gear and broaching practice.

Another important advantage of this equipment is utilized in the day to day design of individual shaving cutters and honing tools to meet certain specified operating conditions. With the computer, all of the many design possibilities are rapidly evaluated in order to be sure of the very best selection.

Red Ring engineering know-how plus high-speed electronic calculation is your assurance of the most effective tooling for your own production needs.

SPUR AND HELICAL GEAR SPECIALISTS
ORIGINATORS OF ROTARY SHAVING,
GEAR HONING AND ELLIPTOID

Write for Bulletin CAP 57-11

NATIONAL BROACH & MACHINE CO.

5600 ST. JEAN • DETROIT 13, MICHIGAN

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

Berlin 1910

BAMAG's Mobile Hydrogen Production Plant, 1910

Germany's capital city is thriving in an aura of rich elegance. Down the Kurfürstendamm echoes the clip of horses' hoofs, drawing gracious carriages past dignified stores that will later earn for that thoroughfare the name of Berlin's "Fifth Avenue."

In another part of Berlin the scene is dominated by smoke-belching factory chimneys, the thump and clatter of heavy machinery, the buzz of engineering activity: familiar sights and noises marking since 1872 the site of BAMAG A. G., today a plant of PINTSCH BAMAG A. G.

Right now, in the year 1910, the first mobile hydrogen production plant is under construction. The process, quickly established as the Rincker-Wolter process, is BAMAG'S own development of the theory of oil gasification. The mobile plants are special designs for filling balloons and airships with the gas. Ferdinand von Zeppelin, inventor of the dirigible, is present at the first plant's test run.

Soon after in 1915, BAMAG makes news with another development for manufacture of hydrogen - the steam-iron method, or the shaft-furnace process (as it is also known). In the first six years, 1916 to 1922, sixteen of these plants are delivered to the U. S. A. The process is widely employed in the oils industries (for hydrogenation of oils and fats). Up to the present day it has lost none of its significance as a major manufacturing process for hydrogen and in 1953 PINTSCH BAMAG came out with the first of its shaft-furnace plants for continnous production.

PR12 + 60

Specialists in Process Engineering

PINTSCH BAMAG
AKTIENGESELLSCHAFT

HEAD OFFICE BUTZBACH / HESSEN
WEST GERMANY

SIX vs. SEVEN is now a reality in Europe. And while the European Free Trade Assn. is a "second-best" for those left out of the Common Market Six, it will create trade preferences that cannot be ignored.

EFTA: Will the New Bloc Last?

EFTA is in business. With it, Europe's trade split becomes a fact.

Last month, the European Free Trade Association countries — Britain, Norway, Sweden, Denmark, Portugal, Austria, Switzerland—began cutting tariffs on non-agricultural trade among themselves, with 1970 the target date for almost complete free trade. That action sets off the EFTA seven (which may be joined by Finland) against France, Italy, West Germany, and Benelux, the six-nation European Economic Community which began internal tariff-cutting with 10% in January, 1959, and slashed another 10% last month.

Hope for an early link between the two was dashed in June. The EEC, caught up in its own dynamic growth, rushing to complete integration of its six economies ahead of schedule, rebuffed the idea of a merger with the Seven. The result is impasse. How long it will last is anyone's guess. But the two blocs will be going separate ways for a while at least.

That makes EFTA the world's newest regional trading bloc to reckon with. And businessmen within EFTA, to say nothing of the outsiders who may already be feeling some competitive hurt, are wondering just what the new creation will amount to.

I. The Second-Best

EFTA shares with EEC the ultimate goal of free trade (save for farm products) among its members, to be reached by a series of tariff reductions and quota concessions. EFTA's first 20% cuts in July will lead by stages to a final 10% cut in 1970. Though EEC is now operating on a faster tariff-cutting schedule than its rival, EFTA could move next year to catch up. There the resemblance ends. Whereas EEC will have a common tariff to all outsiders, the individual tariffs of EFTA members will vary. More important, EEC is aiming beyond economic integration to ultimate political federation; EFTA is a regional free trade group, nothing more.

EEC was born of a determination to bind Germany and France tightly together as the core of a strong European power grouping; EFTA starts life as a confessed "second-best," a trade device for nations linked chiefly by their inability, or unwillingness, to join the EEC.

• **Uncertain**—Even now, most EFTA businessmen, still hoping for all-Europe free trade, are uncertain whether to start switching to new sources of supply within the bloc. Many admit that they are far more concerned with retaining EEC business than with mounting new export drives in EFTA.

But EFTA's July tariff cuts, and others to follow, cannot be ignored by traders within or without Europe. The Commonwealth nations, the Japanese, Indians, Latin Americans and North Americans (see page 1) as well as Europeans are anxiously watching developments. They saw how many British exporters held back June shipments to EFTA nations in order to take quick competitive advantage of the July tariff reductions; how Danish importers of British autos hastened to announce that buyers would receive full benefit of lower duties.

II. New Business

How far EFTA will go toward generating new business for its members—and the amount of trade diversion that will result—depends on how eagerly individual businessmen seize these opportunities. They are being coaxed by their governments to start selling hard in the markets of the Seven.

But opportunities are not limitless. For one thing, trade in basic materials will get little stimulation —most EFTA tariffs on raw items are negligible. Moreover Britain, disposing 59% of EFTA population and 75% of its industrial production, with the only powerful and fully diversified economy in the group, is limited to how much it can substitute EFTA purchases for outside supplies. On the export side, Britons note that of the Seven, Sweden and Denmark are already low tariff countries, Norway is intermediate—and these three take over two-thirds of Britain's EFTA sales (almost $1,000-million in 1959).

• **Preoccupied**—Petroleum is an example. Thirteen percent of Britain's EFTA sales last year were accounted for by petroleum products; yet EFTA petroleum tariffs are small. British oil men are much more interested in heading off protectionist petroleum policies in the EEC than in finding new markets in EFTA.

The big British chemical industry is similarly preoccupied with EEC. Most EFTA chemical tariffs are less than 10% (except for plastics). On the other hand, Britain has a high rate of 33% on many chemicals, and that promises Swiss, Swedish, and Austrian producers an attractive lead in British markets over their continental and U.S. competitors.

Where EFTA is likely to have

substantial impact is in the booming motor vehicle business. British auto suppliers expect handsome advantages over the Germans, French, and Italians in EFTA. The Germans are especially vulnerable. But they are not likely to sit idly by, and are already reported to be cutting prices.

• **Enthusiasts**—Swedes believe their auto industry, though small, will receive a stimulus from EFTA. Before EFTA, a Swedish Volvo carried a heavy 30% duty in Britain; now the tariff is dropping.

The Swedes, in fact, seem the most enthusiastic EFTA members. They say they are convinced that Britain, as leader of the bloc, will take it seriously, and will not make any special arrangement with the EEC without taking other EFTA members with it.

Swedish businessmen are well advanced with their sales campaigning, mainly in Britain. Major exports—wood pulp, timber, iron ore—will not benefit much. But a wide range of specialized manufactures such as machinery, ball bearings, office equipment, furniture, are expected to win larger markets. Paper benefits, too.

Other EFTA partners will probably put more push behind their British marketing efforts. Austrians will be stressing textiles and machinery. Besides benefiting from a special EFTA arrangement on bacon, Danes will have more scope for their industrial specialities. The Swiss are getting some concessions on their watches, and will no doubt push their chemicals, scientific and optical goods.

• **Growing Preference** — For these and other EFTA products, the initial tariff advantages will be small. The preferences vis-a-vis the EEC and other outside suppliers may even be trimmed down during the General Agreement on Tariffs & Trade (GATT) meetings beginning next month.

But GATT agreements can provide only a temporary palliative. Long-term preferences can grow from the initial small competitive advantages gained in bloc trading. EFTA enthusiasts point out that EEC has already stimulated a tremendous increase in trade among its members (West Germany's EEC imports were up 45% in the first quarter of 1960) and insist that there is no reason why EFTA will not have the same effect.

III. "But Will it Last?"

Many members of EFTA, as well as traders everywhere, are skeptical. Will EFTA really evolve into a strong regional trading unit? Or is it merely a transition to some kind of loose all-European customs union, or a prelude to the day when Britain, and possibly other EFTA members, asks to join EEC? One British businessman expressed those doubts last month when he said: "I would not recommend a single new investment for my company as a result of EFTA. It certainly won't last 10 years as a separate trading bloc, and probably not five."

There are three ways to link the rivals. The first is to bargain individually on each item squeezed by EEC-EFTA discrimination. This piecemeal approach will be tried in the next few months, starting with a special "contact committee" set up for the GATT talks. The idea is to resolve the worst trading difficulties through special tariff deals, commodity by commodity, open to non-European GATT members as well.

• **Customs Union**—A more far-reaching solution would be for the Six and the Seven to work toward a common tariff on industrial goods —in effect a customs union. This appeals to EFTA members as a way to get most of the benefits of EEC membership without involving themselves in EEC political commitments. (Quite a few Belgian, German, and Dutch businessmen and politicians would support this scheme, too.)

It is possible that the British will make a bid for such a customs union this year or next. But at the moment, there is no chance that the EEC Commission or the French would accept it.

If these alternatives fail, the only route to cooperation is for Britain, together with some EFTA partners, to opt for full membership in EEC. There is a growing body of opinion in Britain, and elsewhere, that believes this will be unavoidable, especially if the EEC Six continue to move as speedily toward economic and political unity as they have in the last three years. (*Business Week, July* 2, p77)

The Money Is

This is the big problem of foreign investment, say some experts. They are testing their theory now in Peru.

"A SHORTAGE OF CAPITAL is holding back world development."

This familiar lament is accepted as Holy Writ by many businessmen and government officials around the world. Yet many experts question it. The international lending agencies, many governments and private investors, too, have more funds available to put to work. Yet they often find themselves wasting valuable time and money studying investment projects that are poorly-researched, loosely-drawn, and vague.

Indeed, the continuing cry of Paul Hoffman of the United Nations Special Fund is "survey, survey, survey"—to find out what an area's resources add up to, and then draw up a sound plan for investment (IMD—Nov.'59,p15). The money, he believes, will follow.

The argument is underlined by a new practical approach to project evaluation contained in the book *Industrial Development, A Guide for Accelerating Economic Growth*, published last month by McGraw-Hill. There is plenty of capital, argues author Murray D. Bryce, but underdeveloped nations must face up to a fact of life: Lending agencies and private investors are not out "beating the bushes" for projects. On the contrary, they expect projects to be carefully evaluated in advance, and attractively packaged. Such projects are in constant shortage.

• **Bridging the Gap** — Bryce's business is helping bridge the gap between project and the investor. As a project leader for Arthur D. Little, Inc. (see page 17), he is in Peru this month applying the principles of his book.

In Peru, Bryce will concentrate on the "first phase" of a new development program. This entails a preliminary survey to identify projects, and to assign priority rankings for an "action program."

Bryce plans to call in 12 Little specialists, who will spend from a few weeks to several months in

Available—but Sound Projects are Not

Peru. Another eight or 10 experts will make "significant contributions" without a personal visit. And as special problems arise, Bryce will call on others for advice. He expects to complete the job in eight months, at a cost of $180,000 to Peru's government.

• **Big Plans**—Peru has the ingredients for a successful development program: the need, the resources, and even more important, the progressive government. Prime Minister Pedro G. Beltran, the former newspaper publisher and economist who took over the government reins one year ago, has already accomplished a great deal in the control of government spending, in stabilizing and freeing the Peruvian sol.

But Beltran and his minister of development, Alfonso Rizo Patron, dream of a miracle of more Biblical proportions—a Garden of Eden on the eastern slopes of the Andes, now a fertile wilderness less than 300 kilometers from the overcrowded coastal strip. The jungle is so close, yet Peru imports half its timber from the U.S.A.

Rizo Patron envisions a network of highways that will open up the interior, creating markets where there are none today, creating new suppliers of forest products and mineral wealth for world markets. Rich agricultural settlements — raising fruits and vegetables, coffee, and cocoa—would be colonized, offering a new life for the people of the plateau.

At one place in the Andes, on the Rio Mantaro, Rizo Patron sees a power plant with a generating capacity of a million kilowatts, more than the present consumption of the entire country.

• **Go Slow**—Though he says he is "inspired and stimulated" by the possibilities, Bryce has strongly advised against any major expenditure at this point. His constant warning: Do not make premature commitments, do not waste money on unsound projects. "Special advantages" should be treated with extreme suspicion. Bryce warns:

"Too many projects have been built where sufficient or suitable process water was lacking, where local fuel sources were inadequate, where local raw materials turned out to be insufficient, or unexpectedly expensive."

Bryce says the first step in Peru must be a "framework." Would the Rio Mantaro power be high or low cost; and more important, who could use so much power? Would highways be better than railroads? How much would, say, 200 kilometers of highway cost? What are the best access routes into the region? Is there a market for the exotic jungle woods? Does the one farming colony presently in the area offer any clues for a mass colonization program?

"We want to establish an order of magnitude," explains Bryce. "How much development might cost, how long it might take." Recommendations will be limited to detailed feasibility studies, and in what order they should be made.

• **More Immediate**—In the meantime, Bryce says, Peru has pressing problems that cannot wait for a "Garden of Eden." There are only 100,000 workers employed in industry today; and the labor force is expected to increase by one million by 1970.

Every opportunity must be pushed, Bryce says; a minimum goal is to double the direct jobs in industry within 10 years.

Members of Bryce's team will comb Peruvian industry for ways to diversify, to improve production and quality standards, "to make the best of what there is to work with."

Bryce also hopes to come up with two dozen or so new projects to use as a "starting bag" to attract investors. Possibilities include fertilizer, chemical, metal working, textile plants.

The local markets are being investigated, but Bryce thinks it a mistake to concentrate too much on reducing imports. This can stunt a nation's growth, he says. Peru

turn the page

A. D. Little: 600 Brains for Hire

Advising underdeveloped countries is a relatively new activity for Arthur D. Little, Inc., which made its name in engineering and technology research. Out of the firm's laboratories (headquarters: Cambridge, Massachusetts) have come major breakthroughs in half a dozen fields—including cryogenics, or low-temperature technology, which is still dominated by Little scientists. This year alone, over 50 patents will come out of the firm's contract research.

A. D. Little's *Guide to Services* lists 322 fields in which its staff of 600 scientists, engineers, and technical economists have carried out assignments. Under the firm's team approach, any of the 600 can act as project leader.

The economic advisory service was set up after the firm discovered its system worked equally well in the field of general management consulting. Little is so close to Puerto Rico's "Operation Bootstrap" that it maintains an office in San Juan. Peru was impressed by the "action program" Little prepared for Manitoba, Canada, which provided an unlikely parallel with

General Gavin

Peru's problems. The firm is currently working in Pakistan, and negotiations with Saudi Arabia are reportedly underway.

Last year, General James M. Gavin, former chief of research and development for the U. S. Army, became president of the firm. Gavin is actively pushing an expansion program, and he expects someday to have a worldwide network of coordinated laboratories. First overseas facility is an advanced research laboratory in Scotland, "far away from our practical-minded clients."

needs a few good export items that could compete in a Latin American Common Market; in particular, Bryce is looking for "target items" that can be used in tariff negotiations with Brazil.

Bryce has already recommended that Peru set up an Industry Promotion Institute, working in conjunction with a development bank, to carry out the second—or selling phase—of the development program. Bryce is convinced Peru can draw millions of dollars by promoting its investment opportunities. He has also recommended a complete revision of the country's tax laws; for high priority projects, he advises "super-benefits," with tax exemptions of at least 10 years.

• **Principles**—Bryce rejects some of the current theories on economic development—such as the doctrine that underdeveloped nations should concentrate on small-scale, "labor-intensive" industry. The goal is industrial efficiency, he says, and technology is the best arbiter of economic theory. But he stresses that underdeveloped nations should stick to proved techniques; they should not become "guinea pigs" for experiments.

Bryce believes in a practical, step-by-step approach to project evaluation. There should be separate studies of a project's technical requirements, its technical feasibility, and its economic feasibility (here market research is vital).

Commercial profitability should be studied through balance sheet analysis, and not just at the 100% operating rate; investors are notoriously curious about break-even points. Profitability analysis is particularly hard on "white elephant" projects, whether planned by the government or private interests.

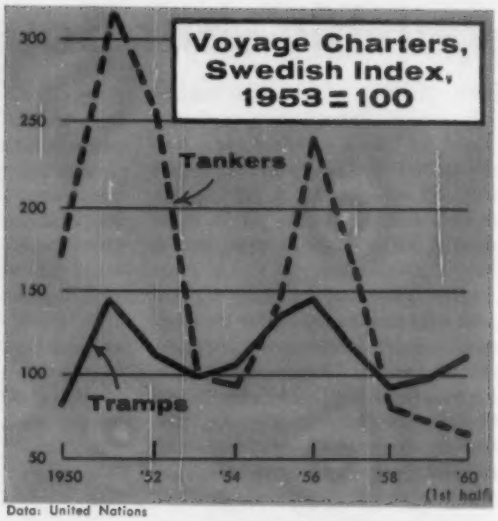
After this, Bryce makes an analysis of national economic profitability. This is of considerable importance to private investors as well as to international lending institutions. An important question, for instance, is how much foreign exchange the project will earn.

• **The Prospectus**—The end result is not just a project report, but a prospectus for investors, containing "a balanced combination of persuasion and proof, of optimistic hopes and realistic evidence." Who will operate the project is an all-important point. ●

Freight Rates

The oil glut, excess tonnage, keep tanker rates down (Korea and Suez were exceptions). And the prospects for tramps are not much better —too many ships is the problem.

Though tramp rates are above the 1958-59 level, they are none too strong.



Data: United Nations

Any Hope for Shipping?

CAPITALIST TANKERS now carry Communist oil. One of the reasons why the Soviets, short of tankers themselves, are making big sales in the West is low tanker rates.

These low rates, and the Soviet Union's audacious use of them, are symptomatic of the crisis in the shipping industry: Too many ships chasing too few cargoes.

Even today's rising level of world trade is not enough to put available shipping back to work, or improve freight rates. Indeed, the only bright spot in the industry today is in passenger traffic, buoyed up by booming tourism.

• **Long Fight**—There are many reasons why the industry faces a long, hard struggle. One is excess tonnage, a problem which can only be rectified by scrapping 10% of existing fleets, according to some experts. And even if all owners privately agreed this is true, scrapping will take place slowly. They are reluctant to drive down scrap steel prices, and are loath to give up business, however marginal.

Government shipping policies are partly to blame. Fleets must be maintained for defense purposes; the U.S.A., particularly, is adamant against scrapping its reserve fleet, claiming that it was caught short badly at the outbreak of two major wars and cannot risk this again.

In addition, governments seek to sustain employment in their maritime industries. They support "flag discrimination" programs (shipment of domestic goods in national bottoms only) and provide subsidies to shipbuilders. The U.S.A., for one, is determined to maintain its regulations reserving half of American foreign aid cargo for flag shipping. The French government is paying $22-million toward the $77-million bill for building the superliner, "France." British shipbuilders say they do not want subsidies, but favor loans to the shipowners, who then could place more construction orders.

In Britain, as elsewhere, nationalism is a factor. The buildup of fleets by countries such as Israel and even newly-independent African nations—Ghana is an example —may be inevitable, but it compounds the surplus problem. Moreover, some countries lack experience in operating fleets. Take South Africa: It tried to enter the shipping race after World War II, and later had to sell ships because of miscalculations.

• **Bright Future?** Throughout the world, the shipping industry foresaw a bright future when World War II ended. And from 1945 to 1956, it sailed through boom times. Shipbuilders worked furiously to replace fleets sunk or damaged during the war; with the revival of trade, shipowners had no trouble finding customers.

But the industry was building itself into a corner. Some of the key

factors responsible for this were:

—Reconstruction, modernization, and rising productivity of shipyards in Japan and West Germany.

—Completion of plans to replace war-damaged fleets.

—Desire of smaller countries, such as Honduras and Liberia, to earn money by allowing foreign ship owners to register fleets under "flags of convenience."

—Competition from airlines, petroleum pipelines, etc.

Then came Suez. With the canal blocked, orders for new tankers and freighters caused a shipbuilding splurge. The result: far more tonnage than is required.

• **Making Do**—Today, realizing it must live with the glut, the industry is beginning to modernize its operating ideas and ship designs. There is progress. Ship operators are relying more and more on converting conventional ships to special-purpose carriers. Roll-on, roll-off ships for carrying loaded trucks are one example; another is Fiat of Italy's specially-outfitted ship for carrying cars; a third is the "container ship," designed for fast loading and unloading of prefabricated cargo packs.

New ships have been developed that are faster, more efficient and, in some cases, larger than those of a decade ago. The U.S.A.'s nuclear-powered ship, the 13,400-ton Savannah, is ready for sea trials. Then there's the plastic Dracone—a huge collapsible bag that can be towed like a barge—to carry oil. And, as a link between air and sea transportation, there is Britain's Hovercraft, riding across the water on jets of air.

Meanwhile, some cool-headed operators—such as the Greek independents—still look for big profits. And they think now may be the best time to build the new ships since shipyards are offering bargain prices.

And some observers believe British tramp operators are more successful in keeping their ships employed—or more ruthless in scrapping uneconomic vessels—than their foreign competitors. For example, only 1% of the British dry-cargo fleet was laid-up for lack of employment at the beginning of June, as compared with the world average of 3%. ●

Currencies: A Ten Year Record

	Indexes of Value of Money			Annual Rate of Depreciation (Compounded)		
	1949	1954	1959	'49-'54	'54-'59	'49-'59
Portugal	100	103	95	−0.6%	1.5%	0.5%
Switzerland	100	94	90	1.2	1.0	1.1
Germany	100	99	88	0.2	2.2	1.2
Ecuador	100	85	86	3.2	−0.2	1.5
Venezuela	100	92	85	1.6	1.5	1.6
Belgium	100	91	83	2.0	1.7	1.8
Pakistan	100	90	83	2.0	1.6	1.8
India	100	99	82	0.1	3.7	1.9
United States	100	89	82	2.3	1.7	2.0
Canada	100	86	79	3.0	1.7	2.4
Italy	100	84	76	3.5	1.8	2.7
Japan	100	78	75	4.9	0.7	2.8
Netherlands	100	79	70	4.6	2.5	3.6
South Africa	100	78	70	4.7	2.4	3.6
Denmark	100	82	68	3.9	3.6	3.7
United Kingdom	100	78	66	4.9	3.2	4.1
Sweden	100	78	65	4.9	3.4	4.2
Norway	100	71	62	6.6	2.8	4.7
New Zealand	100	72	61	6.2	3.3	4.8
Spain	100	82	55	3.9	7.6	5.8
France	100	69	54	7.0	5.0	6.0
Greece	100	63	54	8.9	3.0	6.0
Austria	100	59	53	10.1	2.2	6.2
Finland	100	69	53	7.2	5.1	6.2
Australia	100	61	52	9.4	3.1	6.3
Mexico	100	71	48	6.6	7.4	7.0
Peru	100	66	45	8.1	7.1	7.6
Colombia	100	67	45	7.8	7.6	7.7
Turkey	100	88	45	2.4	12.7	7.7
Uruguay	100	66	31	7.8	14.4	11.2
Brazil	100	51	19	12.5	18.3	15.5
Argentina	100	39	9	16.7	25.9	21.6
Paraguay	100	10	5	37.5	12.9	26.2
Chile	100	27	4	23.1	30.1	26.7
Bolivia	100	11	1	35.7	40.4	38.3

Like any world banker, the First National City Bank of New York keeps a close watch over currencies, their appreciation (all too rare) and their depreciation (all too common). And in its Letter for July, the Bank published the ten year record of currency values shown at left.

Note how most industrial nations have decisively curbed inflation in the '54-'59 period (Germany shows a slight rising price pressure). Among non-industrial lands, Ecuador's record stands out as, says the Bank, a "rebuttal of the idea that economic development requires inflation."

YODER ROTARY SLITTERS

If your slitting requirements call for coil widths from 12" to 60", in gauges from .015" to .250", the economy of purchasing Yoder Slitting Machinery can be yours. Operating a Yoder Slitting Line only one eight-hour shift per week, for example, could easily produce 35 tons of slit strands per week... or 1,820 tons every 52 weeks. At a slitting cost saving of only ½¢ per pound, the annual savings would amount to $18,200.

Additional savings can be realized through lowered inventory of mill-width coils—less waiting for delivery of special slit widths. Also, customer satisfaction will increase as you achieve faster completion and delivery of finished products.

At your request a Yoder sales engineer will study your plant operation to determine what equipment would most economically... and profitably... serve you, whether it be standard components or a completely specialized and engineered line.

Send for Yoder's illustrated text on slitting operations and equipment. It describes methods, time studies, operating cycles, material handling, and gives full specifications.

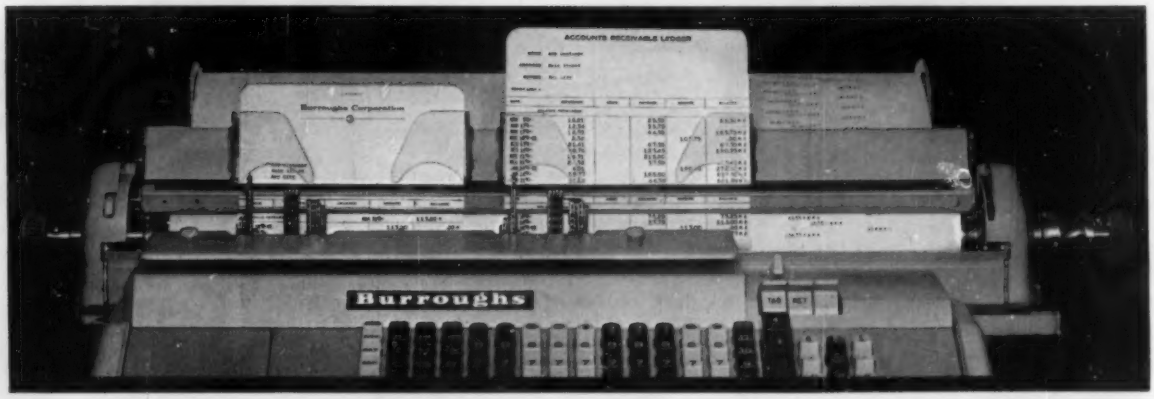
THE YODER COMPANY
5517 Walworth Avenue • Cleveland 2, Ohio

YODER ROTARY SLITTING LINES

from Burroughs...

THE NEW DUAL PRINTER DOUBLES PRINTING OUTPUT

. . . prints two original records simultaneously



. . . and gives you these extra advantages

. . . Form handling time is greatly reduced

. . . No special forms are required

. . . No carbon or special transfer paper is required

. . . Automatic plus and minus sub-totals and totals

. . . Complete keyboard control of error correction

. . . Single motor bar operation for 90% of all entries

. . . And you get an original record for your customer and yourself

These and many other cost-cutting features, provide you with an ideal combination of dual printing and fully automatic accounting. The Dual Printer, like every Burroughs product, is specifically designed to help you do a more businesslike job, faster, at less cost. And you will find that the wide range of Burroughs business machines provides an almost unlimited choice of data processing equipment to best serve your needs.

Burroughs

CALL YOUR BURROUGHS MAN

The Burroughs representative in your locality is always available to discuss with you the latest accounting techniques—and to help you adapt Burroughs complete line of equipment to your present as well as future needs. For his address, consult your directory or write:

BURROUGHS CORPORATION, INTERNATIONAL DIVISION
DETROIT 32, MICHIGAN, U.S.A.

More and more, control of companies reaches across international borders. Here are two examples of what happens when . . .

A Yank Buys in Britain . . .

WHAT IS IT LIKE to be taken over by an American company? Do management personalities and views clash? Do "slick" American advertising and public relations teams ambush unsuspecting executives?

Questions such as these are heard more often as U. S. companies increase their direct investments abroad. And some clues to the answers are furnished by *Business* in an article describing the take-over of Deosan—a small British chemical manufacturing concern—by Diversey Corp. of Chicago.

• **Restrained**—In Deosan's case, the take-over initially was "all terribly quiet and restrained." Diversey's Chairman, Herbert Kochs—who spent four months with the British firm—put it this way: "I was just as scared of them as they were of me."

Kochs quietly began to evaluate his new employees. Within a few weeks, he met most of the Deosan staff on an informal basis. Kochs even spent an hour over tea with an office junior. The result: Deosan management was impressed with Kochs' charm and business acumen.

Then came a sweeping reorganization. The old, dingy rooms of Deosan's London headquarters were cleared of obsolescent equipment and refurnished along contemporary lines—into a "little bit of America." Worth noting: Typewriters and office furniture were chosen by secretaries—a shrewd, morale-boosting move.

• **Pool**—Office methods were revised. All executives (except the managing director) lost their private secretaries to a "Secretarial Services Department"—a tactful name for a typing pool. And dictating machines were purchased to eliminate bottlenecks and the need to hire temporary staff.

Central filing of correspondence was introduced. Liaison between departments was previously so disjointed that customers could easily receive two or three letters on the same day from different departments—sometimes referring to the same subject. Plans also were devised for further economies in filing if micro-filming is adopted.

At the same time, the entire accounting system—bogged down with detail and without sufficient time to prepare the type of information needed by management—came under close scrutiny. The first step towards improvement was the decision to use an outside service center for handling sales analyses. As a result, new information is available to executives only two days after data goes to the center.

• **Better and Simpler**—The practice of keeping huge ledgers and inventory lists was abolished, and replaced with a system of more and better reports, fewer records.

The reorganization went deeper. As Albert Gale, managing director of Diversey (U.K.) Ltd., stated: "Reorganization has gone much deeper than plush, paint, and polish. Improvements have been made not only in office methods, but also in manufacturing and selling."

The American practice of specializing the various components of the sales operation (in Deosan's case, agricultural and industrial chemicals) was instituted. Sales teams were expanded and sent to a two-weeks' residence course (in a hotel) under the direction of a Diversey expert from Canada.

Results? After 16 months under Diversey, Deosan's sales are up 25%; 10 new products have been added; and where there were 250 employees there are now 200.

• **Regrets**—Despite the progress, some Deosan executives have had occasional regrets. They say Diversey's changes brought no miracles, and the same could have been done by any efficient British company. The fact remains, however, that Deosan had had two owners previously, and that it was a firm that "nobody wanted" until the Chicagoans came along. (*Business May, p68*)

. . . Europeans Buy in U.S.A.

LAST MONTH, the Rubber Corp. of America began market-testing German plastics in the U.S.A., as the new American operating arm of European investors.

Its new owners (holding 60% of the stock) are West Germany's Dynamit-Nobel AG, which will steer the company's technological efforts, and the Swiss toolmakers Oerlikon-Buehrle, which will exercise financial control.

• **Unusual**—While U. S. subsidiaries of foreign chemical companies are not uncommon, the case of Rubber Corp. is, reports *Chemical Week*. Its sale constituted an outright purchase of a going concern for operating purposes. Rubber Corp. will become an outlet for German technology and products, despite the fact that it will retain its name.

Foreign control is not new to Rubber Corp.; the majority of its stock was held previously by two British investment banks. But the company's German-born President, William Merton, decided three years ago that a change would have to be made. He realized that his company's competitive survival was dependent upon expansion. And two problems had to be overcome: (1) the reluctance of the British investors to finance expansion, largely because they had little or no technical proficiency; and (2) the need for additional assistance from an established corporation.

• **Where** — Merton rejected the idea of public ownership, or merger with another company of similar size and experience, since neither move would greatly enhance Rubber Corp.'s technical assets. He also was certain that larger U. S. chemical firms would have no interest in buying Rubber Corp., and that a large corporation out of the field would not have desirable skills.

Rubber Corp. was evaluated for purchase by other American companies prior to its overseas sale,

Merton admits. "But what they offered was money, not experience," he recalls, "and we were in sound financial position." According to Merton's logic, a European firm in the same field was the answer.

Chemical Week describes how easy it was for Rubber Corp. to come under European control. Merton is not hampered by a language problem and he "understands the European way of doing business," which he believes most U. S. businessmen do not fully comprehend.

• **Window**—Although Dynamit—one of the biggest European producers of plastic intermediates and finished products—has a large export business, it has few U. S. outlets. Says Merton, "Now it is getting a window on the U.S.A." (Rubber Corp.'s 1959 sales: $12-million.)

"Our biggest problem now," states Merton, "is picking the right products." Once salable products are decided upon, production in the U.S.A. will be initiated. (Engineers from both companies already are planning expansion of facilities.) And the company has full use of Dynamit's technical personnel and of the technology covered under the cross-licensing agreements Dynamit holds. As for financial structure, Rubber Corp. will operate as a division of any large company.

Merton is convinced his firm has lost nothing by this transaction. He points out that the company yielded no equity, gave up only a little technical control. In return it got a bigger product potential, and owners who are 7,200 km. away. "They will rely on our management and will not dictate too much," he says, "because they have found a countryman here who understands their business." Merton also believes that Rubber Corp. will be regarded differently by employees, customers, suppliers, and competitors. Merton believes he may even merchandise the fact of European ownership.

• **Trend** — *Chemical Week* maintains that success of Rubber Corp's program could be a factor in determining whether other foreign companies buy into smaller American manufacturers. For at the same time Americans move abroad, there seems to be complementary trend as foreign businessmen seek manufacturing facilities in U. S. market. (*Chemical Week, June* 11, *p* 31)

How Data Processing Benefits the Small Firm

SMALLNESS is no longer an adequate excuse for management to ignore data-processing techniques. The required equipment—including the electronic computer—is becoming smaller and cheaper every year. And great progress is being made in developing procedures useful to the small firm.

In the U.S.A., high clerical costs —and the relatively large size of companies—often justify data-processing installations devoted to a single task, such as payroll preparation. Since European clerical costs, for instance, are roughly half U. S. costs, it takes double the saving to justify a single-task installation. But this may be a blessing in disguise.

• **Multifunctions**—An American consultant with wide experience overseas, Ralph E. Weindling of John Diebold & Associates, Europe S.A., notes this "refreshing characteristic" of European computer installations: They tend to be used for a wider variety of functions than the typical American installation. To Weindling, this indicates a "progressive attitude."

While applications should not be rated arbitrarily as "good" or "bad," Weindling says, it is generally true that computers make their greatest contribution when used for more than one function. Smaller companies in particular benefit from thinking in terms of "integrated" data processing.

It is not only more economic, but better from the standpoint of management control, to handle payroll accounting as part of a production or cost control system, rather than converting payroll directly to electronic data processing. Again, billing alone might not justify the use of a computer, but billing combined with sales analysis and inventory control might.

• **Punch Cards** — This emphasis on integration may not hold for simple punch-card installations, which handle data mechanically rather than electronically. Since the investment is less, there is little penalty when punch cards are applied to single tasks; and it is more practical to adopt a "step by step" approach toward data processing.

Currently, there is considerable interest in taking punch cards beyond payroll and billing—the most common applications. Many European firms are doing effective work with punch cards in sales analysis and production planning, according to Consultant Weindling.

Smaller firms would do well to investigate the new punch-card equipment coming on the market. A "miniaturized" system, with smaller cards, smaller holes, and costing only $400 a month was recently introduced in Europe. For many companies, a well-designed

turn the page

INTEGRATION AT BOSCH-ARMA

Starting with major assemblies (top two rows) and working down to raw bar stock (bottom), the computer's "memory" unit checks the inventory status of all materials that go into this diesel fuel injection pump—and then automatically issues requisition and shop fabrication orders. The computer is activated with one punched card (a production order).

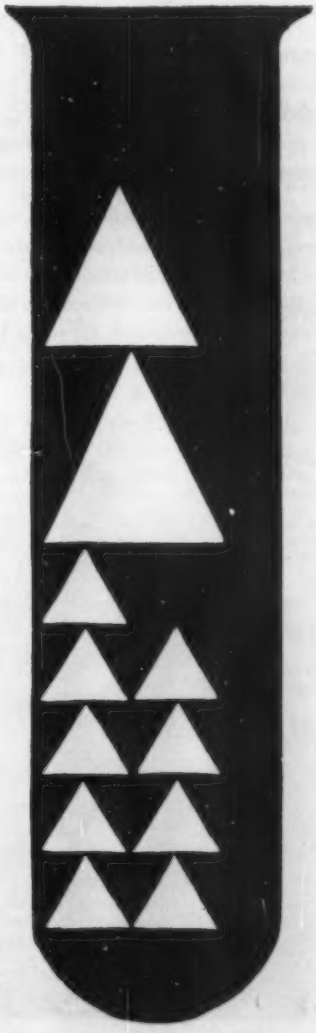
This first application of new Management Operating System (see above), at American Bosch-Arma Corp., interconnects two of the five basic management controls that can be integrated into one data-processing system.

FROM THE WORLD'S MOST EXPERIENCED PRODUCER, **ALCOA,** THROUGH THE WORLD-WIDE FACILITIES OF **ALCOA INTERNATIONAL, ALUMINAS OF HIGHEST QUALITY** for abrasives, catalysts, catalyst supports, ceramics, desiccants, drying agents and dehydrants, electrical insulators, glass, refractories and countless other uses—all from one dependable source. Write Department 2089-K . . .

ALCOA INTERNATIONAL, INC., 230 PARK AVENUE, NEW YORK 17, N. Y., U. S. A.

Subsidiary of Aluminum Company of America

ALCOA INTERNATIONAL



NEW Westinghouse F/A Motors Provide FULL ACCESSIBILITY

For the first time, a unique "take-apart" construction exposes bearing housings and windings – quickly and completely – for inspection, cleaning, servicing.

In-plant experience shows F/A Motors can be completely disassembled in 90 minutes, reassembled in two hours – for a total maintenance downtime not exceeding 3½ hours! Removal of end covers, panels and air shields takes only 38 minutes, replacement another 56 minutes.

Westinghouse F/A Motors also provide: (1) quiet operation through stator isolation from housing; (2) Thermalastic® insulation, exclusive in all Westinghouse large motors, for extended service and coil protection; (3) cables through base, eliminating conduit boxes and making connection of motor leads easy.

F/A Motors are available in a full line of squirrel cage, wound rotor and synchronous types with ratings from 250 hp to 7,000 hp. For full information on these and other Westinghouse motors from 1 to 250 hp, see your Westinghouse distributor. Or write for bulletin 60-B, Westinghouse Electric International Co., 40 Wall Street, New York 5, U.S.A.

punch-card system can be as effective as a small computer.

• **Procedures** — The time may come, of course, when a small to medium-sized computer should be added to the system. And of great interest to the small company is the progress being made in "programming"—development of the mathematical "logic blocks" that control a computer's operation. The equipment manufacturers are building program libraries to cover standard business situations and special problems.

Even in some relatively complicated applications, such as a power company's customer billing, prepackaged programs now cover 80% of the data-processing procedure; the remaining 20% must be worked out for the situation.

• **IBM's "MOS"**—The most advanced thinking in this area is the Management Operating System (MOS) just announced by International Business Machines Corp. Based on a detailed analysis of the manufacturing cycle, IBM has worked out the "logic blocks" for a fully-integrated management control system, covering five basic planning functions. The functions are sales forecasting, materials planning, inventory control, scheduling, and dispatch. The system is fully integrated in the sense that the output from one function becomes the input for another, with all five interconnected. Once the system is set up, operating data from orders, labor tickets, etc., is fed continuously into the computer, which automatically makes routine management decisions.

An MOS program is controlled by an overall "monitoring" circuit, which IBM calls Operating Evaluation. This operates on the principle of "management by exception" — executive decisions are called for only when operations are off-standard or when major changes are required. Furthermore, a MOS-programmed computer can be asked important "what if" questions: "What if we cancel this order at this stage of production?" The consequences are known almost immediately.

IBM insists the MOS concept can be applied by companies with as few as 100 employees. Some of MOS programming can be taken over directly. Mostly, however, it is a problem of redesigning the "logic blocks" to a company's problems.

The first experimental application of MOS is at American Bosch-Arma Corp., where two of the control functions—materials planning and inventory management—have been integrated. After six months, the company reports that savings on production costs are running at the rate of $120,000 a year. That figure is expected to triple when the full MOS program is put in.

• **Service Centers**—Another important trend today is the mushrooming of data-processing centers, operated by equipment manufacturers, independent businessmen, company pools.

A current example: Four Dutch employers' associations have announced plans for a cooperative center, and over 300 small firms indicate a desire to use the computer (a Remington Rand "Univac") for payroll processing. But it should not take very long for the more progressive managements to begin collecting sales, production, and other data for analysis.

• **Slow Progress**—Despite these developments, there are a number of reasons why progress is not more rapid. Few companies outside the U.S.A. have anyone who is directly concerned with management controls, such as a Controller. "Systems and procedures" departments are not common, and the supply of "systems" specialists is limited.

More serious is the charge that data processing lags because companies do not have the basic management controls needed to make a system work—they simply do not have data for processing. It is a truism that greater benefits come from the planning that goes into a data-processing program than the equipment itself. But management is reluctant to spend money to set up procedures.

Some companies go out and buy data-processing equipment, and only then start thinking about the management controls needed—controls they should have been operating "manually" for years. This is an expensive and inefficient way to go about it, to be sure. Even so, data processing deserves the credit for changing their thinking—and for being one of the greatest forces for modern management today. ●

FOR EVERY BASIC ELECTRICAL NEED— LOOK TO

Westinghouse

SUPPLIES THE EQUIPMENT

Throughout the world, thousands of Westinghouse products of advanced design and dependable performance serve innumerable industries and utilities. The constant research, application experience and organized product development behind Westinghouse equipment make it the logical choice where sure reliability under demanding production schedules is essential. Here are three representative examples:

DUPLEX CIRCUIT BREAKERS — Newly added to small breaker line, these plug-in units protect small wire or appliance cord circuits at building loadcenters; house two s-p breakers in same space as older single breaker types. In 15 and 20 continuous ampere ratings.

GAS TURBINES — High efficiency 8,000-hp gas turbine, designed for easy, money-saving inspection and maintenance by lifting top cover to expose power turbine and compressor. Bearings and rotor alignment undisturbed. No cooling water needed; low oil consumption.

POWER TRANSFORMERS — Many types and sizes, embodying such features as Shell-Form, Form-Fit design for superior mechanical and dielectric strength; compactness; inner-cooled construction; Insuldur insulation system for 10% greater overload capacity.

CLARK EQUIPMENT moves mountains . . .

. . . of earth for new highways

Typical scene on a typical highway construction job—a MICHIGAN Dozer push-loading a MICHIGAN Scraper. Big advantage of these modern machines is their great earthmoving capacity—more in one minute and one load than 50 hand-laborers could move in one day. Photo was taken on new highway construction in Canada, but you can see the big yellow MICHIGANS *wherever* contractors are interested in speed, economy, and size.

. . . or airplane supplies

To airline travelers all over the world, CLARK towing tractors are a familiar sight. These fast-moving electric or gas-powered "buggies" hustle baggage, food, mail—even tow four-engine airplanes. Used in almost every airport everywhere, their high speeds and all-weather dependability make a major contribution to the speed and comfort of air transportation today.

Michigan is a registered trade-mark of

CLARK® EQUIPMENT

CLARK EQUIPMENT INTERNATIONAL, C.A.
Apartado 2717, Havana, Cuba

Construction • Material Handling • Truck Trailer Equipment

Associated manufacturers in Argentina, Brazil, Belgium, England, France, Germany, Australia, Japan, and U.S.A.

What It Takes To Get the Job Done

WHEN AN EXECUTIVE falls down on the job, the trouble seldom stems from technical incompetence. This is the conclusion of Ashley Associates, Ltd., a Manchester-based management consulting firm which has studied over 200 situations of "executive failure" in Britain.

Most companies accurately know the technical qualifications necessary for a particular job, says Managing Director Alan D. Ashley. But they know far less about what qualities an executive must have in order to "get on with the people around him."

• **Environment**—Stumbling blocks are not the minor problems that result when an executive occasionally drinks too much, dislikes playing golf with company associates, or dresses differently. The main trouble, according to Ashley, is how to adjust an executive's age, background, ambition, and attitudes to the job environment.

In Britain, executive failure occurs most frequently in medium-sized companies. Small, family-controlled enterprises, with 150 or so employees, seldom generate serious stresses and strains. In big companies, job requirements tend to be well-defined within a rigid social structure—an environment that attracts "organization men."

In-between, there are many companies with 500 to 1,500 employees, expansion-minded, and changing from paternalistic to professional management. Here are some typical cases involving such companies:

A managing director chose an assistant whom he hoped to "control," but who was expected to show initiative when called upon. Once under "control," however, the assistant became too submissive, finally had to leave.

A young executive took a job requiring fast expansion of a company's product development and marketing. But he proved to have too much drive to fit in with the company's relatively old-fashioned management methods.

Two competent sales managers quit a job in succession because of difficult dealings with the production manager, a man who took no interest in sales problems. ●

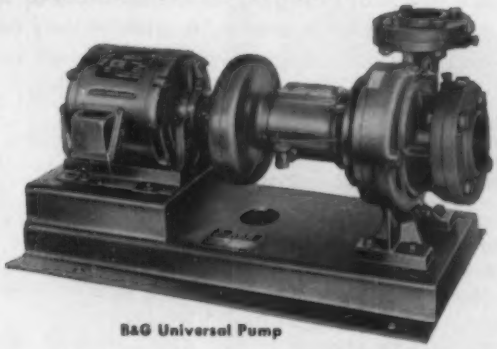
Hydro-Flo® PRODUCTS

. . . EQUIPMENT FOR HEATING AND CIRCULATING WATER

You are assured of highest quality and undivided responsibility for satisfactory operation when you standardize on B&G equipment for circulating and heating water. The B&G emblem is recognized everywhere as a warranty of excellence. The products shown here are described in detail in catalogs available upon request.

CIRCULATING PUMPS FOR FORCED HOT WATER SYSTEMS

B&G Booster



B&G Universal Pump

B&G Boosters and Universal Pumps are available in a complete range of heads and capacities for forced hot water heating and service water systems. These pumps are engineered and built to operate without vibration and *without noise*. Sturdy construction of the best materials assures dependable performance for years. Over 3,000,000 have been installed to date. Write for Catalog GC-1259.

B&G Flo-Control Valve

B&G Relief Valve

B&G FLO-CONTROL AND RELIEF VALVES

B&G Flo-Control Valves prevent gravity flow in forced hot water systems, and permit year-round operation of indirect water heaters. They can be cleaned easily without need to break pipe connections.

B&G Relief Valves are built in both standard units and to meet A.S.M.E. Code requirements. They are offered in a wide range of capacities to permit close matching of relief valve capacity to the boiler load. Write for Catalog GC-1259.

B&G HEAT EXCHANGERS

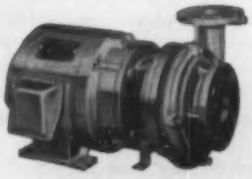
B&G Type "SU" Heat Exchangers—Steam-to-water Catalog SI-159

B&G Type "WU" Heat Exchangers—Water-to-water (pumped boiler water circulation) Catalog GC-1054

A broad range of sizes is available for water-to-water and steam-to-water heat transfer applications. B&G Type "SU" and "WU" Heat Exchangers are rated for instantaneous heating of water for service use... radiation... snow melting panels... swimming pools... boiler feed... storage tanks and process work. Many commonly used sizes of "SU" and "WU" Exchangers are available immediately from factory stock.

B&G COMMERCIAL AND INDUSTRIAL CENTRIFUGAL PUMPS

Series 1522—Catalog IG-459



Series 1531—Catalog HY-558

B&G Series 1522 and 1531 Pumps have a long record for dependable and economical performance. These pumps feature *quiet*, vibrationless operation, leak-proof mechanical "Remite" seal, and many other exclusive features. Large range of capacities... commonly used sizes are carried in stock.

BELL & GOSSETT
COMPANY
Dept. GH-25, EXPORT DIVISION
Midland Park, New Jersey, U.S.A., Cables: Marlopumps

● MARKETING

Americans Abroad: Accent on

Lured by expanding economies abroad, prodded by foreign competition and by their government's export promotion program, American businessmen are "internationalizing" their operations at fast rate. Below are some examples of how they are this year going about the business of winning new customers overseas. A wide variety of goods and services are involved. But in each case you will see that the accent is on Marketing.

For Oronite: "Missionary" Marketing in West Europe

THE BEST INDUSTRIAL PRODUCT in the world will fail if potential customers do not understand it. This Oronite Chemical Co. learned trying to sell isophthalic acid in Europe.

Isophthalic is an organic intermediate that competes with phthalic anhydride, used in polyester and alkyd resins. Oronite had begun its sales effort in Europe by distributing samples to producers of plastics and surface coatings. As a subsidiary of Standard Oil Co. of California, Oronite had the benefit of Standard's European sales organization in Geneva.

• **Interest**—The samples drew strong response from Europeans. They liked the price, lower than phthalic anhydride (often in short supply). But actual sales did not match the interest.

The reason? Manufacturers did not know enough about isophthalic acid; they were disappointed when they tried it. "We cannot use it," they said. "It just does not work."

When T. M. Welton, Oronite's marketing vice president, heard of this he decided on an immediate, whirlwind sales development tour. He sent Robert Stevenson, product specialist, on a 29-day, nine-country visit, complete with a sales promotion armory of photographic slides, laboratory samples, and models. Stevenson talked with some 400 management and technical men, in large groups and small, sometimes for hours at a time, explaining the basic economics of isophthalic acid.

• **Personal**—Breathless after his tour, Stevenson says: "I've never been through such intense questioning." And he adds that more was done through personal contact than could have been accomplished by "months of mailings."

Now, Oronite is studying orders and inquiries stimulated by Stevenson's market-development blitz. It has high hopes that isophthalic will gain a share of the burgeoning European market. It is planning continuing technical service to back up its sales. And it is convinced that European businessmen like U.S.-style "missionary" selling. (*Chemical Week, June 4, p47*)

Denver Chicago Exports A Transport "Package"

FROM HEADQUARTERS in the Rocky Mountains, a U.S. trucking company is aggressively marketing its services overseas—and believes it has "only scratched the surface" of the business available.

A year ago two vice presidents of Denver Chicago Trucking Co. spent several weeks in Japan visiting businessmen, shipping lines and agents, and traders. The aim: to convince them to route their U.S. shipments via Denver Chicago trucks. To that end, the company worked up an attractive package of services—a through bill of lading from point of origin to ultimate destination, a "ship-truck" service including packaging, containerization, pickup and delivery to ocean carrier followed by delivery in the U.S. via Denver Chicago.

• **Worldwide**—The response was encouraging—so much so that two D-C executives recently took another trip, this time around the world, to sing the praises of their transport package. They are following up with direct representation in many of the countries visited, and are strengthening facilities at home with the assignment of foreign trade specialists in U.S. port cities.

The effort appears to be paying off. The company's import business in the first four months of 1960 exceeded the total for all 1959.

International GE Carves An Image Out of Diversity

BIGNESS causes marketing problems. Consider International General Electric Co.'s continuing effort to influence potential buyers of its myriad industrial products—everything from tiny aircraft components to entire hydroelectric plants.

Obviously, IGE cannot advertise all industrial products in all markets of the world. Yet advertising supervisor Rodman Sweeny is convinced that printed advertising is essential to maintain communications with widely scattered distributors and customers.

• **Where? What?**—But where to advertise? Sweeny finds that in many markets, local business and industrial publications either do not exist, or offer inadequate coverage. IGE industrial goods tries to strike a balance between local and international publications. But in practice, of the 40 or more media used regularly, less than 30% are local.

And what to advertise? Because of the huge diversity of products, there is a temptation just to talk in very general terms about GE quality and research—institutional or "corporate image" advertising. But rarely does this kind of advertising tell a potential customer exactly what GE can supply to him. On the other hand, there is a danger of focussing too closely on this or that product. Here the customer is likely to say, "Is that all they make?" perhaps followed by, "Our local people make the same thing!"

So Sweeny has been trying to walk a tightrope between the two kinds of advertising. Right now IGE has a campaign combining information about GE's corporate

Marketing

credentials—"Progress is Our Most Important Product"—with specific description of products, installations, engineering services. When IGE does product advertising as such specific cases and products are integrated with the GE quality-dependability theme.

• **Concepts**—Now a new IGE industrial goods campaign will lean to the other side of the tightrope, hardly mentioning products at all. Instead it will involve three industrial "concepts," all directed at Latin American industry. "One-Source Buying" will suggest buying all electric equipment for plant modernization from one supplier—GE. "Productive Maintenance" will try to reassure plant managers who fear automatic equipment is hard to maintain. "Planned Automation" will sum up, and prepare the ground for sales of GE automatic equipment. (*Printers Ink, June* 3, *p*44)

Glass Tinting Organizes To Meet Overseas Demand

OVERSEAS INQUIRIES stimulated by advertisements in trade magazines first led the American Glass Tinting Corp. (Houston, Texas) to set up an export department. In the past few months, overseas business has run at an annual rate equal to two-thirds of total sales—$600,000.

American Glass Tinting is the exclusive distributor for Sun-X, a liquid plastic tinting compound made by E. I. du Pont de Nemours Co. that cuts the sun's glare, its heat and fade-causing rays. Dealers pay up to $10,000 for a franchise, then buy the tint from American Glass Tinting; there are minimum inventory and sales quotas. The dealers charge by the square area for applications to retail shops, office buildings, etc.

• **Special Talent**—Export Vice President Thomas Lanier has tapped an unusual source of talent: Cubans in exile. Andres P. Chaumont, a former Cuban diplomat, brings his experience to bear on the company's biggest problem—import and currency repatriation licenses. Other Cubans include a former bank president and a stock exchange official.

Lanier and Chaumont are currently circling the globe, in opposite directions, looking for more dealers. So far there are dealers in 49 cities in 28 nations outside the U.S.A.

Motorola Reorganizes For Better Control Over Exports

UNTIL RECENTLY, responsibility for export sales at Motorola Inc.—maker of radios, TV, communications equipment—was divided among the company's divisional sales groups and handled through independent export firms which also sold other products. Now the company has adopted a new approach, through its newly-organized Motorola Overseas Corp.

The reorganization was handled by Thomas P. Collier, now president of Motorola Overseas, who reports directly to Motorola president Robert Galvin.

• **Shake-Up**—Collier joined Motorola two years ago, and one of his first assignments was a world tour. He found many of Motorola distributors were involved in home furnishings or lighting; some distributors were acting as both importers and dealers. And many dealers were weak financially.

What was needed, Collier decided, was a distribution pattern essentially the same as that in the U.S.A.—regional distributors, dealing in electronics exclusively, supplying a strong dealer network. Within the last year, 60% of the distributors in important Latin American markets were changed.

Collier then had marketing specialists assigned to his export group. The final step is Motorola Overseas, which takes full responsibility for the export program.

Collier is confident that the new setup will help Motorola compete with European and Japan companies for "third country" business. He puts emphasis on product demonstrations, flexible credit, enlightened advertising, product development aimed at overseas markets (more reliability, fewer gadgets), intensive market research, exploitation of smaller markets (which are substantial in total), and better service.

Overall, Collier expects overseas

VALVES, DRIERS, STRAINERS FOR REFRIGERATION AND AIR CONDITIONING

Since 1914 Henry air conditioning and refrigeration valves and accessories have been recognized for their complete on-the-job satisfaction throughout the world. Available in a wide variety of sizes and types for refrigerants 12 and 22, etc. and for ammonia service.

Write for latest catalogs and prices.

HENRY VALVE CO.

3223 North Avenue,
Melrose Park, Illinois
(Chicago Suburb) U.S.A.
Cable: HEVALCO,
Melrose Park, Illinois

VALVES, DRIERS, STRAINERS, AND ACCESSORIES FOR REFRIGERATION, AIR-CONDITIONING, AND INDUSTRIAL APPLICATIONS

BETTER AIR includes HEATING

...and BETTER AIR IS OUR BUSINESS!

If you have a problem involving heating air, an AAF product will provide the answer! For example:

- Heating and ventilating units ranging from 400 to 55,000 cfm are adaptable to the varying warm air needs of offices, auditoriums, schools, gymnasiums, stores, and factories.
- For special applications, heaters (unit, portable, horizontal, vertical), heating systems, controls, and heat exchangers are offered in wide selection.

Only AAF makes *all* the products (air-heating, air-cleaning, air-cooling, air-moving) to provide business and industry with *complete* BETTER AIR systems. Write for the name of your nearest AAF representative and a copy of complete-line Bulletin No. 518.

AAF

American Air Filter

COMPANY, INC.

255 Central Avenue, Louisville 8, Ky., U. S. A.

Representatives in 36 countries

CABLE ADDRESS: AMFIL

business to increase 20% this year over last. And already, sales in prime markets of Latin America have almost doubled.

OMISA's Leisure Product Becomes a Workhorse

OUTBOARD MARINE CORP. is opening new export markets by putting its product to work. To promote commercial uses for outboard motors, the company has replaced pretty girls on water skis with commercial fishermen, lumbermen, and other workers using outboard motors on barges, skiffs, punts, sampans.

The company's export marketing arm is Outboard Marine International, S.A. (OMISA), incorporated in Caracas, Venezuela, with executive offices in Nassau, The Bahamas. OMISA sales, up 40% in the past two years, now account for about 7% of total corporate sales. For its stock in trade OMISA taps its Marine factories in the U.S.A., Canada, Belgium, and Australia.

• **Strategy**—"You can't sell an outboard motor like a bar of soap," emphasizes Ernst Ott, advertising director. "The people whom we sell internationally want to know what is under the hood. These motors are their means of earning a living. They want owner and service manuals, they want to know how much power they will need to propel a certain size boat loaded with, say, bananas, and how fast it will go. And our distributors must have excellent service facilities." Or as one dealer puts it: "Service breeds sales; sales never breed service."

The biggest marketing problem, according to Ott, is to convince governments to free outboard motors from the high import duties imposed on purely recreational equipment. This is accomplished by showing how the motors can increase the standard of living. (British Honduras was one of the first governments to be convinced.)

Outboard Marine recently sponsored a conference in New York attended by government officials from 37 contries, all from underdeveloped areas. The conference was so successful the company plans to make such affairs a regular feature of its marketing program. Prominent speakers, such as Jan-Olof Traung, chief of the fishing boat section of the United Nations Food and Agriculture Organization, and films helped to get the company's arguments across.

• **Cases**—In both advertising and promotion, OMISA makes heavy use of case histories. Short of propelling ocean liners, the outboard motor has found uses in almost every form of water transportation—moving cabbages to market in The Netherlands, loading cargo vessels off Central America, picking up copra in the Pacific, gathering logs for sawmills, delivering mail, ferrying passengers. (*Printers Ink, June 3, p52*)

Avon Visits "Door to Door" With No Changes in Policy

DOOR-TO-DOOR SELLING is proving as successful overseas as in the U.S.A., where over 300 companies do some $3,000-million worth of business, in a wide range of industries, by "personalized service" selling. But only a handful have ventured outside North America.

Avon Products, Inc., a cosmetics maker, is one that has, and it is expanding its overseas forces. The company now has over 10,000 saleswomen outside the U.S.A.; and their efforts account for about 7% of total sales ($142-million last year). Significantly, Avon has not had to change any of its basic policies. "Door-to-door" selling, it has found, differs little from country to country.

• **Part-Time Agents**—Avon's representatives are housewives, chiefly, who agree to work exclusively for Avon in the area they live in. Thus, they sell to people of their own class. Each woman makes her rounds armed with a portfolio of samples—which she explains and demonstrates—and takes orders. Representatives sell the same products as in the U.S.A.—a total of 199 items ranging in price from 59 cents to $20.

The rising standard of living in Latin America, in particular, is benefiting sales, according to an Avon official. The reason is not only more customers: More and more women are welcoming the chance to do this kind of part-time work. Avon recruits representatives chiefly through newspaper advertisements and word-of-mouth recommendations. In each country, a scale of commissions is worked

Quality - and what is behind it

024 AI

The Construction

With every new model Mercedes-Benz engineers set new standards in technical development, in quality and in styling. That these standards are acknowledged all over the world is proved by the rapidly growing number of motorists who choose the safety, the comfort and the beauty of a Mercedes-Benz.

MERCEDES-BENZ

ACCOBOND

BONDING AGENTS

The missing link

Modern living has brought about radical changes in manufacturing processes.

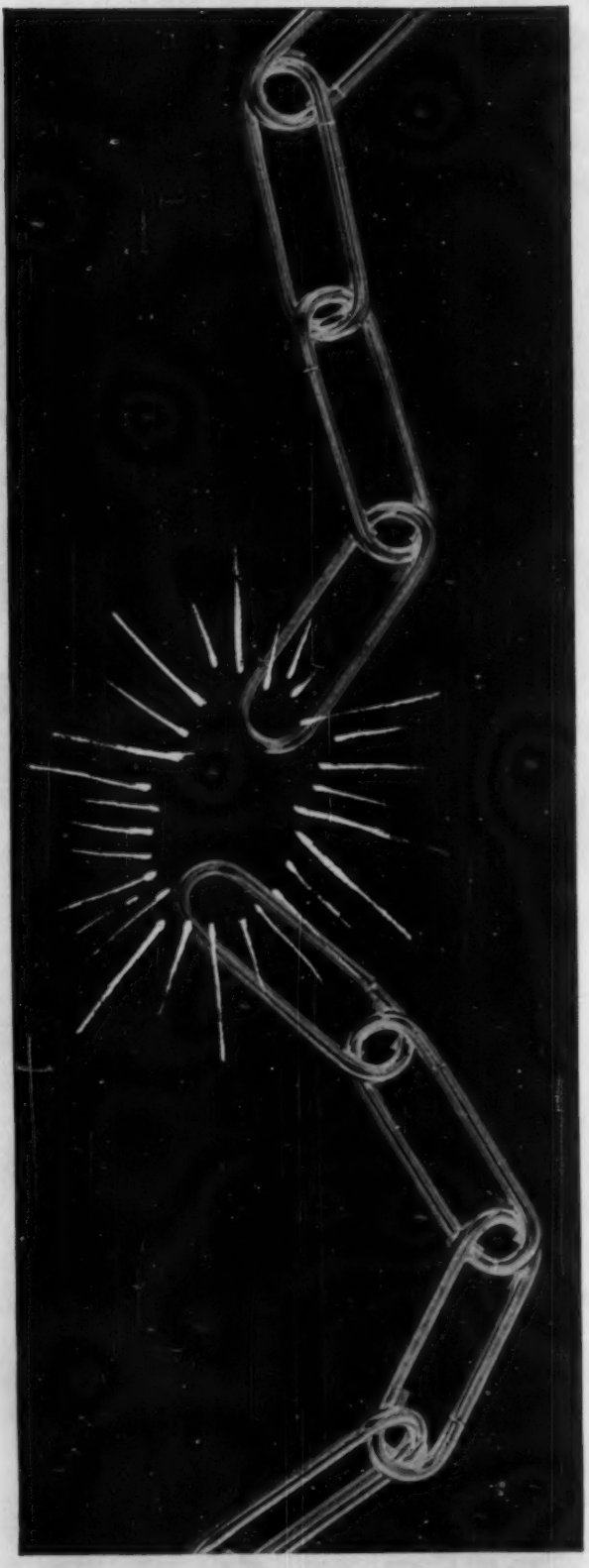
The cellophane industry, for instance, could never have achieved the importance it enjoys were it not for the various coatings that add to its usefulness a hundredfold by making it moisture-vapor impermeable and heat-sealable.

ACCOBOND* Bonding Agents are anchoring agents that have been adopted by cellophane manufacturers as an important item in their coating process. They provide the missing link for the secure anchorage of various coatings to cellophane.

ACCOBOND Bonding Agents are cationic melamine-formaldehyde resins recently introduced by Cyanamid after years of research, and may be just the thing you are looking for, if you use or need an efficient anchoring agent for top coatings. Their bonding, antiblocking properties and stability are superior to other materials developed to date.

ACCOBOND Bonding Agents can also be the missing link in hundreds of other manufacturing processes. Take aluminum metal for instance. The bonding of many coatings to the surface of aluminum may be substantially improved in many instances by the prior application of an ACCOBOND Bonding Agent.

Why don't you write us for full technical information on this valuable new Cyanamid product?



CYANAMID

CYANAMID INTERNATIONAL
A Division of American Cyanamid Company
General Chemicals Department
30 Rockefeller Plaza, New York 20, New York
*Trademark

out so that the representatives can earn at least as much as a stenographer.

Avon has sales subsidiaries in Puerto Rico, Venezuela, Cuba, Mexico, and Brazil, and a factory in England, which supplies the United Kingdom and West Germany.

Pilot Operations Help Brunswick Sell Bowling

HOW TO SELL ten-pin bowling overseas is the marketing problem at Brunswick Corp., leading producer of bowling equipment. Not only must it create demand for American-style bowling, but it must sell investors on putting up the $200,000 or more needed for a modern commercial bowling installation.

The sport of bowling is neither new nor American. The Italians play boccie, the Scots curl, the British have skittles and the Germans Kegel. What Brunswick, as well as its powerful competitor, American Machine & Foundry Co., is trying to do overseas is take bowling out of the beer hall and basement and into large modern installations—with from 12 to 100 or more lanes equipped with automatic pin-setting machines, attractive to the entire family, day or night, winter or summer. With rising living standards and more leisure time in many areas of the world, Brunswick sees a chance of duplicating overseas the fantastic success of bowling in the U.S.A., where some 26-million bowlers spend nearly $500-million a year on their sport.

• **Too Poor?** Several years ago, Manuel Garcia, Vice President for marketing at Brunswick International, decided to experiment in Puerto Rico. Despite the U.S. influence there, many predicted that the venture would fail: Puerto Ricans are too poor, they said, and besides, they will not be interested in "family bowling."

Garcia went ahead, spent $10,000 for heavy promotion of bowling (1) as a sport, (2) as a profitable investment. There were newspaper ads, radio and TV announcements, and direct mail. It worked. Today Puerto Rico has at least six bowling establishments, and Brunswick has several big new customers.

Getting started in Europe and Asia is perhaps more difficult. Brunswick is using the technique

ECONOMICAL TRENCH PRODUCTION

...digging in a densely compacted roadbed

A U.S.A. contractor got high daily production from his sturdy Cleveland Trencher on this 38-mile gas extension in northwestern U.S.A. The gas line will serve several large industrial users of natural gas and numerous smaller users along the line. The Cleveland dug the 40-inch deep trench at a rate of better than 10,000 feet a day.

Typical of the entire Cleveland Trencher line, this Cleveland model provides over 30 non-slipping digging wheel speed-and-power combinations—a choice that gives maximum trench production in all soils and terrains with greatest economy for every type and size of digging within its range.

CLEVELANDS dig, fill and compact trenches of all types:
- gas, water, sewer, utilities lines
- petroleum and product pipelines
- drainage and irrigation systems
- electric cable and conduit lines
- building foundations

TRENCHERS • 10 MODELS
with a digging range of 8 inches to 52 inches wide and down to 7½ feet deep.

SIDECRANES • BACKFILLERS TAMPERS
2 models for handling, laying pipe, backfilling and compacting trench.

Write for Bulletin L-109 containing brief descriptions and specifications on the complete Cleveland Trencher line.

The CLEVELAND TRENCHER Co.

Good Everywhere

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO • U.S.A.

CABLE ADDRESS: TRENCHER

TAUNUS

A full line of Taunus commercial vehicles that offer exceptional durability and performance at low upkeep. Whatever you need in a commercial vehicle, you'll find a Taunus to suit you.

Engineered for rugged service and top performance, Taunus commercials offer a choice of payload capacity (1000 and 1250 kilogram) and dependable motors (40 or 60 HP-SAE). Loading areas are spacious, with wide, flat platforms for easy access. And you can buy according to your specific needs – from the popular vans and omnibusses through a wide range of special bodies.

The omnibus shown in the main illustration is a perfect example of the flexibility of Taunus Commercials. It is available as a delivery van, with 5 cubic meters loading space; as a comfortable 5-seater; in a deluxe version with room for 9-10 passengers; as the famous "Little Giant", that carries up to 14 persons. Call on your local dealer for full information. If you're looking for a commercial vehicle that gives long, dependable and efficient service, you'll want to see the Taunus line.

gives you DURABILITY

Van: For dependable rapid transport; high payload. Easy loading and unloading. Low upkeep. An ideal partner in your business.

Pick-Up: For heavy loads! Deep loading area with wide rear gate. Available also with frame or canvas covering.

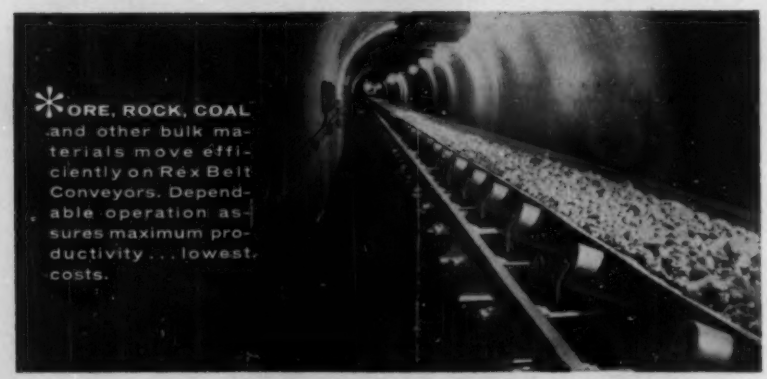
Twin-Cab: An exceptional, all-purpose vehicle with high payload and room for 5 passengers.

TAUNUS COMMERCIALS

Quality Masterpieces from **FORD** of Germany

How to keep it * moving profitably

*BOTTLES, CANS, JARS move smoothly and economically on Rex TableTop Chains. Simple design with no gap between links prevents tipping of containers.



*ORE, ROCK, COAL and other bulk materials move efficiently on Rex Belt Conveyors. Dependable operation assures maximum productivity . . . lowest costs.

*SMALL PARTS, PACKAGES, BOXES are moved swiftly and economically on Rex Roller Chains. Precision construction assures quiet, smooth operation.

For dependable, efficient conveying and power transmission, Rex Chains, Sprockets, Roller Bearings, Belt Conveyor Idlers and Pulleys are the preferred choice the world over. In the complete CHAIN Belt line, there is a type and size that will exactly meet your requirements. They stand up under the most severe operating conditions...eliminate costly, premature failures that mean lost production time.

Your local CHAIN Belt Distributor will be happy to give you the complete story on Rex Power Transmission and Conveying Equipment...Water and Waste Treatment Equipment. CHAIN Belt also makes Rex Concrete Mixing, Hauling, Placing and Road-Building Machinery. CHAIN Belt Company, 4654 West Greenfield Ave., Milwaukee 1, Wisconsin, U.S.A.

REX®

CHAIN BELT COMPANY

EXPORT OFFICES: Milwaukee 1, Wis., and 19 Rector St., New York 6, N.Y., U.S.A. Distributors in all principal cities of the world. Cable Address: "BELTCHAIN."

of "pilot operations"—in Britain, Denmark, Germany, Italy, Australia, Japan. Brunswick will not say exactly what is involved, but outsiders guess that the company helps subsidize "demonstration" bowling centers. With appropriate publicity, advertising, international bowling tournaments, etc., these are counted on to catch the attention of potential consumers and potential investors.

Brunswick is backing its efforts with an affiliate in Eire that makes bowling equipment, a licensing agreement in Germany for the manufacture of automatic pin-setters, and a joint manufacturing venture in Australia.

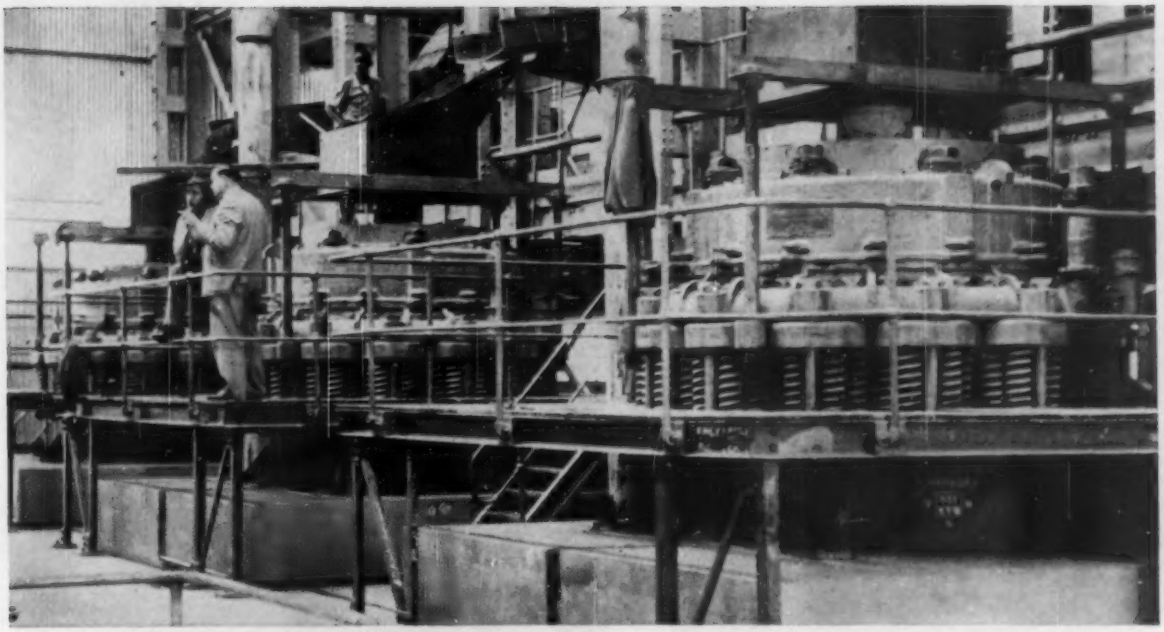
Rust-Oleum Introduces Its Sales Technique to Europe

"WITHOUT this sales force going over," comments Rust-Oleum Corp. President Robert Fergusson, "it would take us 10 years to do what we are doing." This summer, timed for the opening of a new plant in Haarlem, The Netherlands, the company sent 17 of its key marketing men to Europe to acquaint 16 distributors with Rust-Oleum techniques for selling its rust-inhibitive paints.

Before the men left home, they spent six months studying languages, customers, and special demonstration kits. They are visiting a succession of assigned market territories to set up basic selling programs, a sojourn of one to two months for each man, more for some. Total cost of the project is estimated at $175,000.

• **Selling Service**—In planning the European invasion, Fergusson says he learned from other companies that you have to use your "first team" in overseas selling: "We sell service," he says. "We go out and analyze conditions, commit ourselves on a method, and give a complete maintenance program." And demonstration, an important point in the company's selling strategy, is relatively new to Europe.

Sales are expected to triple in a year; Rust-Oleum already has plans to increase the plant's capacity by sixfold. Ninety percent of the Haarlem production will be exported, eventually servicing 85 foreign industrial distributors. (*Business Week, May* 14, *p*58)



• Shown above are three of five Symons Cone Crushers serving a typical copper mine installation in Northern Rhodesia.

COPPER

...and SYMONS® CONE CRUSHERS

The name *copper* is from the Greek κυπρος, Cyprus, one of the early sources of the metal. Copper has often been called "the common man's gold"—and has become a symbol of *money* due to its wide usage in the coins of many nations, as well as a symbol of *power*—since the greatest usage of copper has been as a conductor of electricity.

While native copper is the only metal found abundantly in nature, commercial production is supplied chiefly from various ores of copper, including chalcopyrite, chalcocite, cuprite and malachite.

Wherever these copper ores are processed, you'll find Symons Cone Crushers the leading choice among the world's prominent producers. For in copper . . . as in all of the important ore and mineral operations around the world . . . Symons Cone Crushers have consistently maintained their prominent position by efficiently processing large tonnages of finely crushed product at low cost.

© 1960, N. M. CO.

XC-160

NORDBERG MFG. CO., Milwaukee 1, Wisconsin, U.S.A. Cable Address: NORDBERG

LONDON: 19 Curzon St., W. 1
JOHANNESBURG: 6 Hollard St.
MEXICO, D.F.: Dolores 3

NORDBERG THE WORLD OVER

Represented in principal trading areas throughout the world

flying start!
When Pan American's giant Boeing 707's leave London Airport, it's Thames 800 vans that carry the turbines that start them on their flight. With the enthusiasm and appetite for work that's typical of all Thames vans, these 800's move around the airport runways with efficiency and energy that never flags. Take a good look at them—starting up the giant jets or delivering ice cream to the shop around the corner . . . running kids to school or carrying fruit, flowers or vegetables to your home from the other end of town. Whatever they're doing, Thames 800's keep hard at it all the time. And the tighter their schedule, the more they enjoy it!
PAN AMERICAN
THAMES VANS & TRUCKS
PRODUCTS OF FORD MOTOR COMPANY LIMITED · ENGLAND · BRITAIN'S LEADING EXPORTERS OF LIGHT COMMERCIAL VANS
BE FIRST ON THE ROAD WITH FORD OF BRITAIN

● TECHNOLOGY

Scrap Earns Extra Dividends

Many plant managers are discovering that proper handling of scrap can mean profits, whether they themselves use the material or sell it on the open market.

A U. S. MANUFACTURER of sand-finished bricks found recently that its broken and defective tile—formerly hauled away as useless—could be ground to particle size and dusted on to raw bricks. The company no longer has to buy sand for brick dusting; and its salvaged tile offers better color control and better adherence to the brick.

This is one instance of how a factory's scrap can be turned into savings. Many companies are learning that their scrap can be changed to riches, whether they use it themselves or sell it to the market. In the U. S. A., dealers handle $4,500-million of scrap annually.

• **Many Forms**—Valuable scrap takes many forms, such as broken ceramics, metal fragments, plastics, even water. Scrap goes many places—not only to dealers, but to other factories, smelters, refiners, and even to other departments in the originating factory. For example:

—A large metal smelter discovered that the sludge at its copper and lead refineries contained valuable quantities of the rare metal tellurium—selling for about $65 a kilogram in high-purity grades. With the new research in thermoelectricity, the demand for tellurium has increased sharply (IMD, July). Experts believe that residues from U. S. metal refineries now may yield more than 500,000 kg of tellurium.

—A manufacturer of bottle crowns found that it could create a new product out of its scrap. The company now carefully spaces the punched-out crowns about .3 cm apart and saves the perforated tinplate. The plate is no longer sold as scrap at $10 a ton, but is used as a frame for air filters, worth several times that price.

• **The Scrap Market**—Experts suggest two handy rules for getting value for your scrap: (1) know the market and its prices; (2) know how the scrap industry operates.

Prices are complex and seldom stable. They can hit an all-time high one week and fall just as precipitously the next. Since scrap is a by-product, the prices are determined almost entirely by the consumers' needs. The industry closely follows the law of supply and demand; when inventories are high, prices are low.

Plants use a wide variety of raw materials. Separation by primary metals—copper from brass, brass from aluminum—is a step toward proper scrap usage. But there are many grades within these categories. There are 110 grades of non-ferrous metals, for example, 42 grades of waste paper, 24 grades of rubber. Make an effort to know exactly what you are selling.

Scrap is often someone else's raw material. The wise manager will find out what kind of scrap is needed, and in what form it will have the greatest value. Market value depends on how scrap is shipped—whether bundled, boxed, baled or loose. Slight processing such as shearing, breaking, and drying often can increase value.

• **Segregation**—By keeping metal tailings segregated and free from contamination of other metals a company can get a better price for its scrap. Here are some meaningful data from a scrap control manual prepared by U.S.A.'s Marquette Aircraft Co.:

—Mixed aluminum scrap is worth less than three-fourths as much as scrap separated and placed in marked containers.

—If steel scrap is mixed with aluminum scrap, the value of the aluminum scrap drops 60%.

—Re-usable stainless steel is worth four times as much as plain segregated scrap.

The magnet plays an important part in scrap separation and identification, and experts find it is cheaper to segregate scrap at its source than to separate it later. One U. S. firm found that it could get higher scrap prices by separating their magnetic materials.

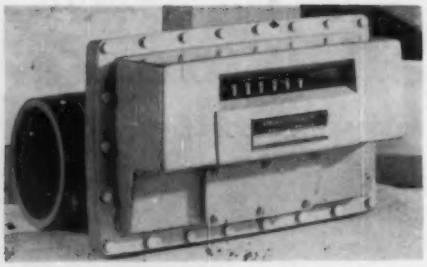
Today, the cleaning of scrap is also aided by electronics. Detection systems are based on balanced inductive fields which become unbalanced by the presence of any metal. One electronic glass cleaning operation sorts out any tramp metals in crushed TV tubes. The glass is then used in melts to produce new tubes.

• **Scrap Handling**—Efficient containerization and transport of scrap through a plant is essential to a scrap recovery program. Materials-handling equipment can prove a wise investment. Scrap handling containers are revenue-producing tools that can be used for scrap, raw materials, products, and even plant wastes. And many plant managers have found hidden profits when they apply production transportation techniques to their scrap programs.

The Western Electric Co. was able to profitably handle 50 tons of scrap a day with self-dumping hoppers and radio-equipped platform trucks. Hoppers were placed directly at the scrap producing machines, then moved by platform truck to a chip crusher. Then the turnings were separated from their cutting oils in a centrifuge.

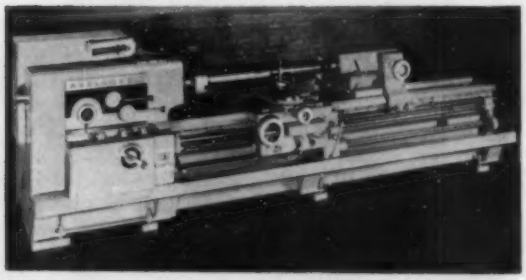
• **Scrap Dealers**—Many scrap dealers offer more services than merely hauling away waste materials. Some dealers provide engineering information to aid in identifying types of waste materials. Others will provide containers, trucks, or other physical facilities.

Dealers in plastics and rubber scrap often provide advice on changing plastics or rubber waste into a usable form. It is possible to work with plastic scrap producers to design new product lines for waste plastics. (*Purchasing Week, Apr 25, p30; Factory, June, p105*)



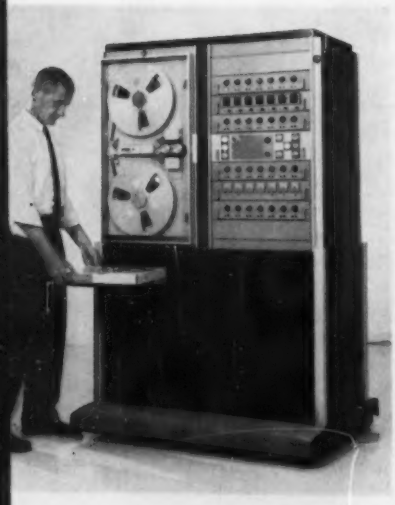
INDUSTRIAL FLOWMETER offers an improved method of metering natural gas. The unit does away with multiple measurements—volume, pressure, temperature—and their integration. The key to the system is a two-axis spinning gyroscope, whose minor axis rotates as any unbalanced force is applied. *General Electric Co.; Black, Sivalls & Bryson Inc.*

ALL-WELDED ENGINE LATHE resulted from a critical look at past design. A survey showed these objectives: increased rigidity, higher horsepower, greater range of speeds and cutting feeds; provision for numerical control. Key features of the new unit: mechanisms built into one rigid structure; headstock extended to the floor; interchangeable parts provide many beds with a single headstock. *U. S. Industries Inc.*



New Designs Combine Function

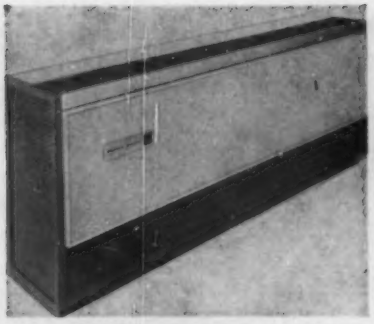
Here are the winners in a U. S. design contest conducted by Product Engineering magazine. Experts studied 96 entries, judged on many values—how a unit works, how it looks, what basic needs it satisfies.



DATA TAPE RECORDER was designed after an extensive field survey showed the basic design concepts and package configurations preferred by customers. The survey showed the need for control panels that clearly indicate what they control. To accomplish this, bold symbols, bright colors, and strong color contrasts are used. A special team of design, tooling, marketing, and manufacturing men—headed by one project manager—were housed in a separate building to stimulate the free exchange of ideas and talents. *Ampex Corp.*

AUTOMATIC 35MM CAMERA takes the guesswork out of amateur color photography. A miniature galvanometer controls the shutter action. A cam coupled to the diaphragm insures the proper opening at the instant the picture is taken. *Eastman Kodak Co.*

VISIBLE RECORD COMPUTER—the first of its kind—reads magnetic-ink data on checks and deposit slips, then posts entries to customers' ledgers. The system, operated by a single attendant, includes four machines: 1) a sorter-reader, which sorts and reads 1560 documents a minute; 2) a computer; 3) a record processor that posts and proves the computer's calculations, then prints the customer's balance; 4) a console. *Burroughs Corp.*

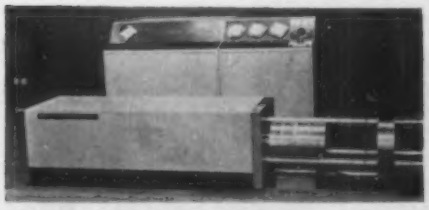


CLASSROOM VENTILATOR for window wall is low to permit ample light, shallow to economize on space. It is silent, but contains multiple fans to recirculate air, filter, cool. An economy was to make the body in charcoal finish, offer a choice of color in panels. *American Air Filter Co. Inc.*

HEAVY-DUTY ROUTER was redesigned to emphasize sales appeal, but insure high-speed operation, low manufacturing cost. Designers made a part-by-part study of manufacturing costs, then designed out items that added to cost. Functional features: vacuum pulley; two-speed motor control; interchangeable spindle assembly; pneumatic foot control for lowering or raising the router head. *Onsrud Machine Works Inc.*

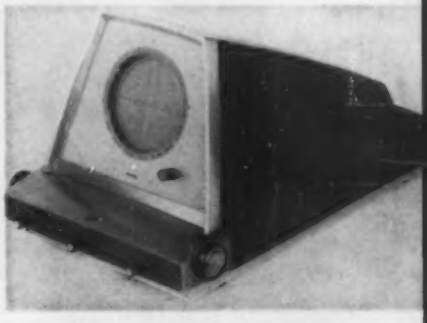
and Sales Appeal

CLINICAL SYSTEM makes possible the routine analysis of very small samples of blood in medical laboratories. Taking larger samples can endanger patients. The system has been welcomed by pediatricians and medical technicians, and now has been modified for industrial laboratories. *Beckman Instruments Inc.*



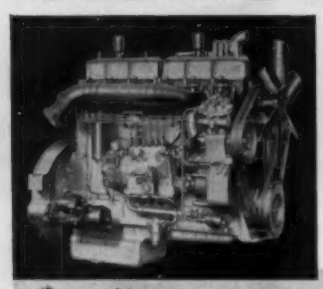
FORMING MACHINE uses high-impact energy, from a gas-driven piston, to shape exotic materials to close tolerances. System has three components: machine proper, console, power supply. *General Dynamics Corp.*

RADAR UNIT was designed as one of a series of lightweight instruments for small boats. Compact packaging was essential for each of these units. Designers developed a common die-cast front housing for the several units—a production saving and a means of corporate identity. Cover of radar unit is of metal sprayed with vinyl. *Sperry Rand Corp.*



DATA-ACQUISITION UNIT consists of a high-frequency, sequential-sampling electronic switch for channeling data for computer processing or storage. Designers aimed at a synthesis of appearance and functional advantages. The result: less exterior hardware and decorative trim; connection panels integrated into total design; an improved presentation of product name and corporate signature. *Radiation Inc.*

MOST PRODUCTION with WAUKESHA POWER



A typical Waukesha medium six-cylinder Diesel. Other Diesel, gasoline, and gas models—up to 1200 hp.

For service—in any country—or any climate—stamina and dependability are built-in. Power packed—to pay profits in fast, smooth performance, fuel economy, and low upkeep—Waukeshas are the choice of operators and owners alike. Engine-Generator Sets (ENGINATORS®) for all standard fuels . . . from 50 to 800 KW.

X-488

Export Department
WAUKESHA MOTOR COMPANY • WAUKESHA, WISCONSIN, U.S.A.

MANDREL inside this part is melted out and then rinsed with water.

Mandrels Dissolve from Odd Shapes

REMOVING A MANDREL from a glass-laminated part without causing damage is almost an impossible task, especially if the part is in the shape of a corkscrew or tree.

It is impossible unless the mandrel materials can be washed out or melted out. That is what happens to plastics being tested by U.S.A.'s Chance Vought Aircraft.

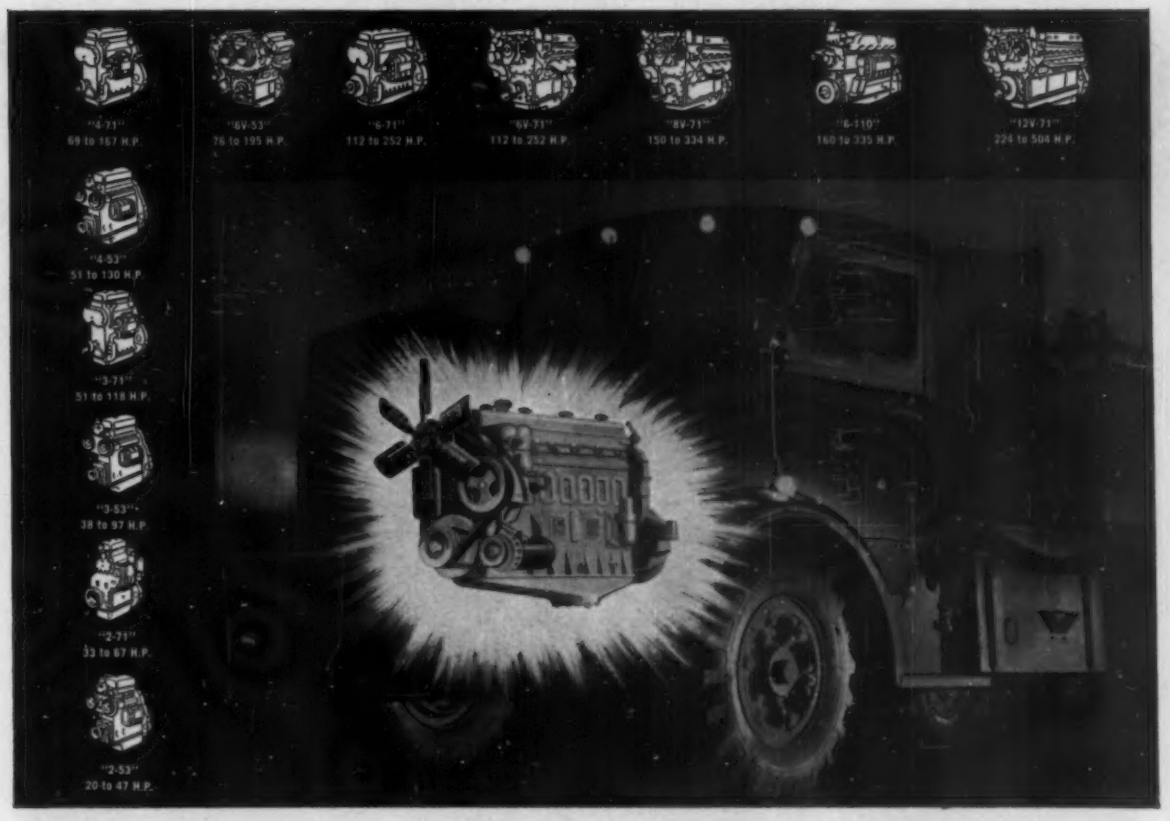
For the wash-out procedure, the mandrel can be either placed under running water or soaked in a container. Tap water removes a kilogram of the materials in about 20 minutes. Hot water or steam does the job in four to ten minutes.

The mandrel can be melted out by placing it on end in an oven. If the material is not contaminated, it can be remelted and reused.

• **Better than Plaster** — Both mandrel materials are more versatile than plaster, which usually has to be knocked out. They have a low reject rate, because their toughness makes them resistant to bonding pressures. They can be cast very thin, yet support the pressure of shrink tape or tension wrapping.

Even some of their disadvantages, such as brittleness and extreme affinity for moisture, can be offset. For instance, adding shredded fiber glass to the molten slurry will strengthen the mandrel and counteract thermal cracking.

Molds for pouring the mandrels can be made out of aluminum or heat-resistant epoxy or phenolic laminate. Chance Vought technicians say that the phenolic laminates cure about six times as fast as the epoxy. The aluminum molds do not retain their heat as well as the plastic laminates. (*American Machinist/Metalworking Production, May* p79)



Now there's a GM DIESEL for every repower need!

Take the step now to reduce operating costs and downtime that may be bleeding you of hard-earned profits because of your efforts to maintain gasoline trucks and vehicles in peak operative condition.

Repowering with GM Diesels is the sensible solution. They cut fuel cost! They increase payloads! They reduce maintenance and overhaul costs to an absolute minimum!

And GM Diesel repowering is *practical* and *profitable!*

Practical because their high horsepower-to-weight ratio and compact 2-cycle design permit replacement of gasoline engines of equal rating in a wide range: from fork lifts to local hauling vehicles—from medium duty on-highway to heavy-duty off-highway trucks.

Profitable because they provide fuel and operating economies far superior to the gasoline engines replaced.

Look into the vital improvements GM Diesels can bring to your operations. See why truckers today are realizing significant savings and profits they never before thought possible.

Whatever your power need, there's a GM Diesel tailored in size, in weight, in torque requirements to fill it. For complete information call your local GM Diesel Distributor. Or write to your nearest GM overseas plant.

GENERAL MOTORS OVERSEAS OPERATIONS

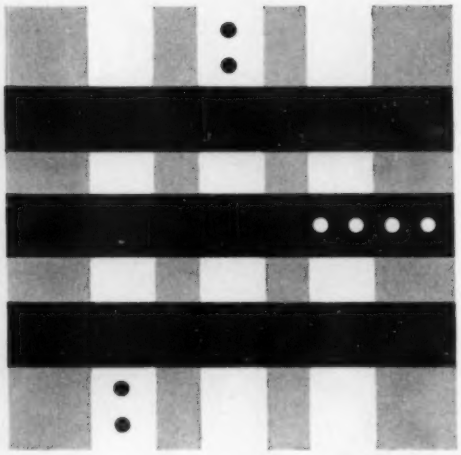
DIVISION OF GENERAL MOTORS CORPORATION, 1775 BROADWAY, NEW YORK 19, N.Y., U. S. A.

GM GENERAL MOTORS DIESEL POWER

FOR ADDITIONAL DETAILS, CONTACT THE GMOO REPRESENTATIVE NEAREST YOU.

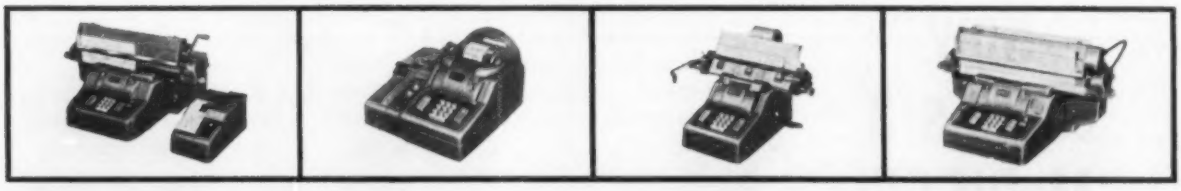
ARGENTINA, Buenos Aires **AUSTRALIA,** Melbourne **BELGIUM,** Antwerp **BRAZIL,** São Paulo **DENMARK,** Copenhagen N.
ENGLAND, London, S. W. 1 **FRANCE,** Paris **GERMANY,** Russelsheim/Main **MEXICO,** Mexico, D. F.
NEW ZEALAND, Wellington **PAKISTAN,** Karachi **PERU,** Lima **PORTUGAL,** Lisbon **SOUTH AFRICA,** Port Elizabeth
SWEDEN, Stockholm 20 **SWITZERLAND,** Bienne **URUGUAY,** Montevideo **VENEZUELA,** Caracas

GENERAL MOTORS LOCOMOTIVES



Vertical or horizontal working procedure?

Independent of whatever working principle is used, the speed and efficiency you demand of your organization is only possible with the aid of modern office machines.
Addo brings you office machines, for simple or complicated calculation; also accounting systems for integrated or electronic data processing.
From production centers on two continents Addo products are today distributed to over 100 countries.



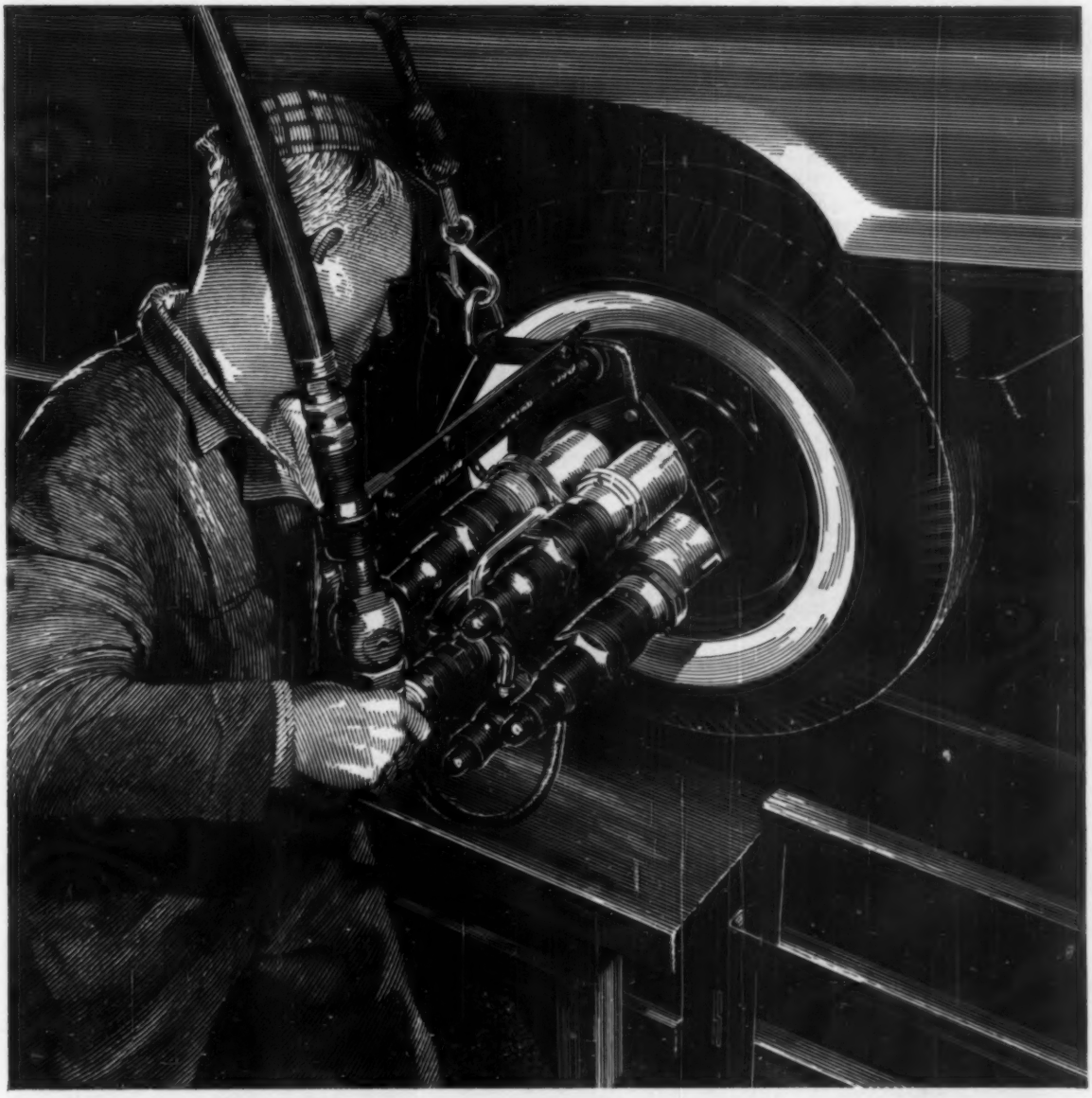
Efficient, easily operated, economical — these are the foremost characteristics of the Addo-X model 2341, favourite among adding machines.
Multiplier-memory, separate keys for short-cut multiplication, symmetrical key-board with Feather Touch and single-functioned, interlocking keys as well as all the other carefully tried Addo-X features give unprecedented reliability and speed. The Addo-X adding machines are also available in Sterling Models.

Addo-X Model 2341

Addo base their foresighted production on traditional Swedish quality.

ADDO MALMÖ

S SWEDEN Land of business machines



Voiture . . . wagen . . . lorry . . . car

—a motor vehicle has many names, but whatever its name, wherever it is assembled, you will hear the name "Gardner-Denver." With ever increasing vehicle production, air tools have taken over much of the machining and assembly work. Gardner-Denver air tools perform superlatively: at controlled torque nut-setting; multiple, simultaneous drilling; high-speed screw-driving. Through forward-looking research Gardner-Denver has pioneered not only air tool refinements but many exclusive improvements in mining, petroleum and construction tools.

Now, from a fast-expanding international network of plants, Gardner-Denver products and "on-the-spot" service are readily available.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Gardner-Denver International Division • Quincy, Illinois, U.S.A.

Using the Earth's Heat

Geothermic plants now are operating in Italy, the U.S.A., U.S.S.R., and New Zealand.

ESTIMATES of the world's power needs are constantly being revised upward. And despite the promise of the atom, much of this need will come from improved steam plants —like Sweden's new 150,000-kw underground station at Stenungsund—and a part from the earth's natural steam and hot water.

Three years ago Italy, with its elaborate installations at Larderello (IMD, Oct '58, p40), was the only country converting its "free heat" into commercial power. Now sizable plants are in operation in three more countries—the U.S.A., New Zealand, the Soviet Union—and several other installations are on their way.

• **California**—The U. S. A. got its first commercial geothermic power this year with the start of a 12,500-kw turbine-generator, using steam from a field of geysers 150 kilometers north of San Francisco. The production facilities cost $1,750,000. Another $250,000 went for a 16-km transmission line routing the electricity into the lines of Pacific Gas & Electric Co., who will pay 2.5 mils (.25 cents) per kwh for the new energy.

Geologists say that the steam from these fields will continue undimished for many years. Wells sunk in 1922-25 are reported to be producing at the same volume as when first drilled.

Steam from the earth has much larger quantities of non-condensable gases than steam generated in conventional plants. Elaborate tests were made in California to determine the amount and nature of these gases. Special equipment was installed to remove much of these gases, and stainless steel is used on some lines and equipment.

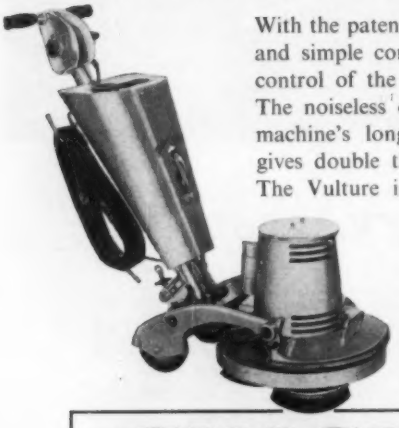
• **New Zealand**—The Maori people of New Zeland for centuries have used hot water from the volcanic ground on North Island for cooking and heating. The Government now has completed a $16-million generating plant at Wairakei for converting this water into 69,000 kw of electricity.

Engineers drilled a series of 20-cm bores 150 to 900 meters into the volcanic ground. Water comes up the bores at above boiling temperatures, and then is converted to steam for driving the turbines. The Government plans on increasing generating capacity at Wairakei eventually to 252,000 kw.

• **Siberia**—The Soviet Union's first geothermic power plant is on the Kamchatka Peninsula, in the northeast corner of Siberia. The area used to get its power exclusively from coal shipped up from Vladivostok. Now undisclosed amounts of electricity are being generated from natural steam and the same source is heating houses.

Exploration of geothermic sources also is going ahead in other parts of the U. S. and the Soviet Union, in Mexico, France, Iceland, and El Salvador. And scientists are studying the possibility of using earth heat even where water or steam is not naturally present. (*Electrical World, June* 27, *p*145; *Steel, June* 27, *p*53)

HEAVY DUTY FLOOR SCRUBBING AND POLISHING
TRIPLE-BRUSH ACTION TAKES CARE OF GOOD, WORN OR UNEVEN SURFACES

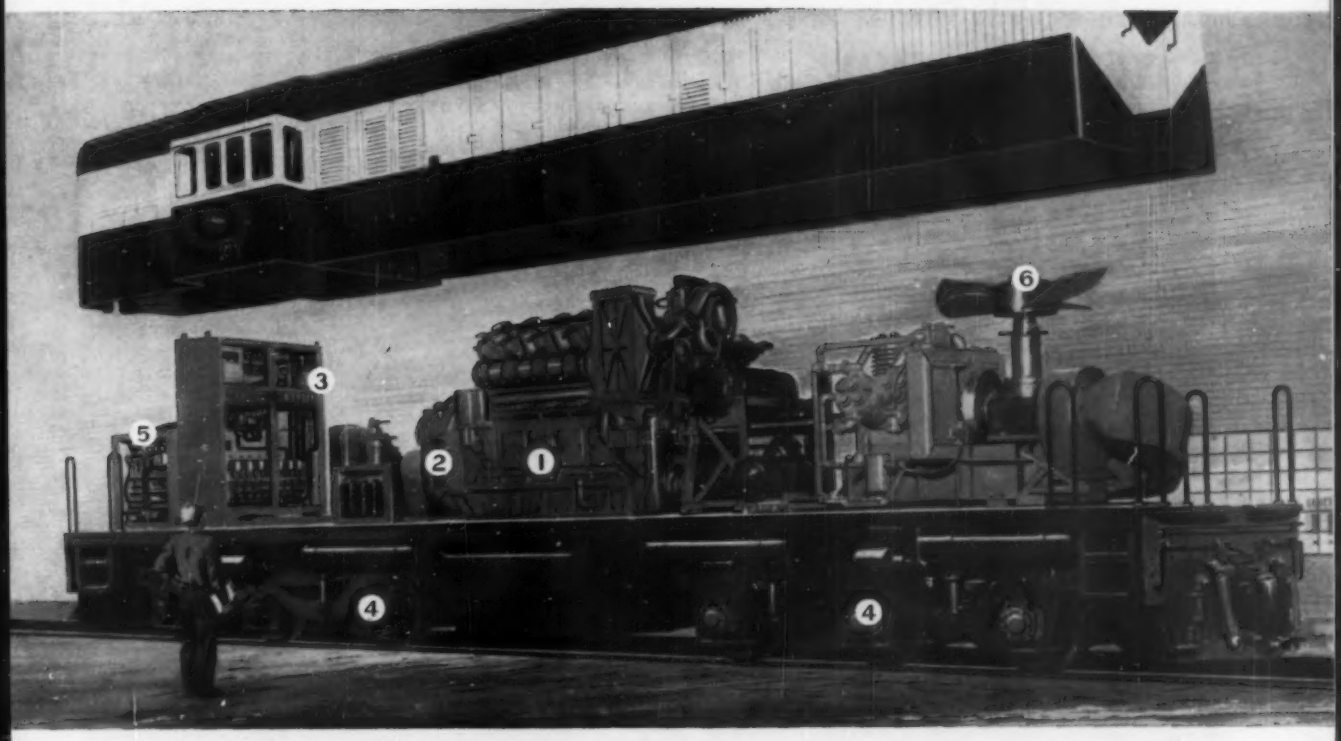


With the patented triple-action brush mechanism and simple controls, the operator has complete control of the machine at all times.
The noiseless operation remains throughout the machine's long life, while the reversing action gives double the brush life of similar machines.
The Vulture is the largest and most powerful machine which can be handled by female operators.
To prevent discoloration of floors and reabsorption of dirt the 'Dipper 4' Suction Dryer is used to lift both dirt and water immediately after scrubbing.

CIMEX

VULTURE HEAVY DUTY FLOOR SCRUBBER AND POLISHER

Please write for details to:
CIMEX LIMITED
75-97 CRAY AVENUE · ORPINGTON · KENT · ENGLAND
Tel: Orpington 26731
CIMEX THE WIDEST RANGE OF FLOOR CLEANING MACHINES IN THE WORLD CIMEX



POWERHOUSE ON WHEELS

When was the last time you stopped to count the cars of a train as it whistled past a crossing? Did you ever wonder how powerful the locomotive must be to haul such a long line of freight cars? Were you ever curious about what makes a locomotive work?

In a General Electric locomotive it begins with one of the most powerful diesel engines (1) known to the railroad industry. To it is joined a high-speed generator (2) to produce the economical electricity which is the actual driving power. By means of a simple control (3) developed by G.E. for locomotive use, the operator gently controls this giant of efficiency by regulating the amount of electricity that flows to each axle-mounted (4) motor. Modern braking equipment (5) also regulated by electricity is furnished for safe, easier train handling; and a huge fan (6) provides large amounts of cooling air for all this power-producing machinery.

These basic parts, combined with many other smaller components, are unified as shown above. Assembled with infinite skill and covered with a colorful welded-steel exterior, this giant of the rails is specifically designed to haul more goods faster . . . at less cost.

And chances are this electric workhorse will still be on the job 20 years from now!

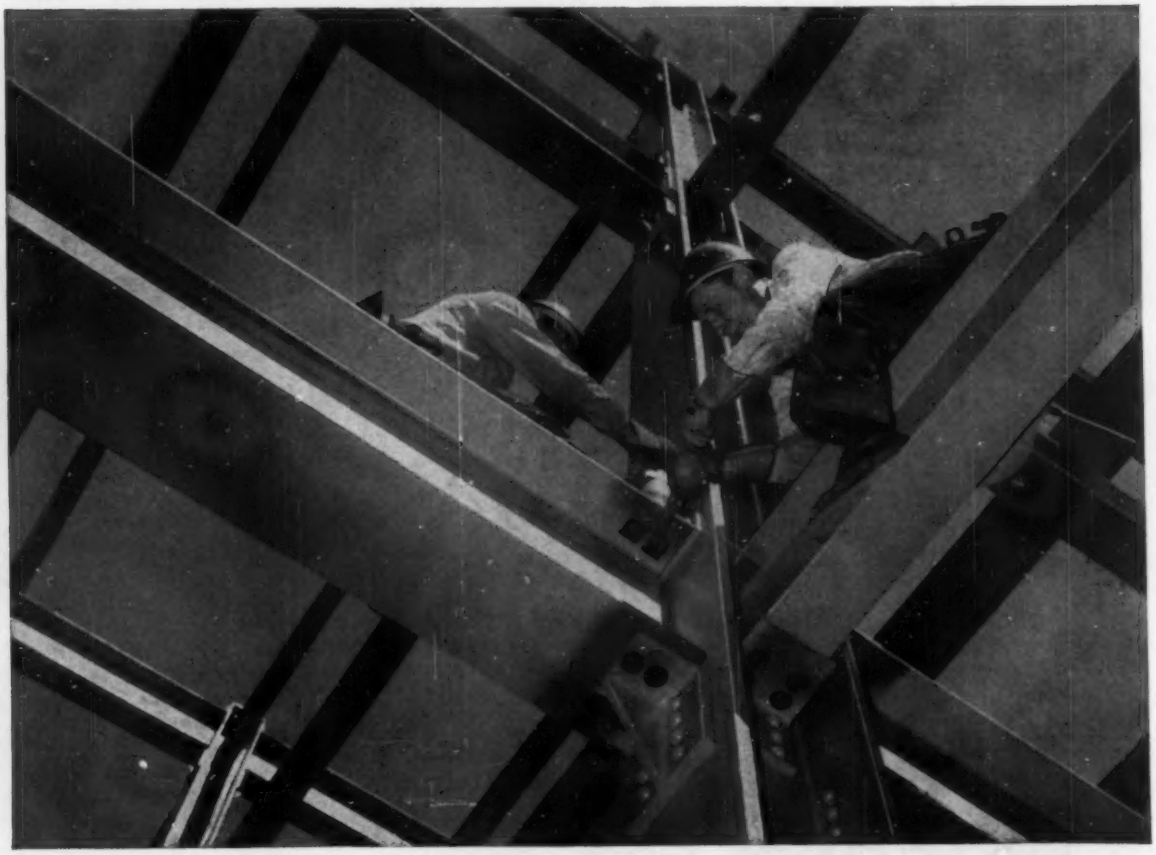
Next time you see a modern diesel-electric locomotive, think about these things; and remember, too, how important a railway can be to the economic development of your country. 200-E3

Progress Is Our Most Important Product

GENERAL ELECTRIC

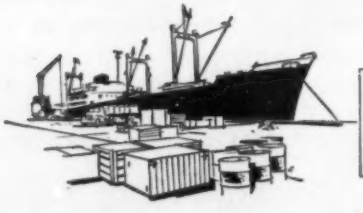
LOCOMOTIVE & CAR EQUIPMENT DEPT., ERIE, PA., U.S.A.

more steel...better steel



To meet the increased demand for more steel throughout the world, Bethlehem is constantly modernizing and expanding its plants in the United States of America. Equally important are Bethlehem's continuing efforts to achieve the highest possible quality in every ton of steel produced. Whether you need alloy steel, cold rolled, hot rolled and galvanized sheets, pipe, tin plate, wide flange, standard structural shapes or sheet and H-piling or other kinds of steel — you can rely on receiving top quality when you specify Bethlehem. Bethlehem Steel Export Corporation, 25 Broadway, New York 4, U.S.A. Cables: BETHLEHEM NEWYORK.

BETHLEHEM STEEL



Bethlehem's great Sparrows Point plant in the Port of Baltimore is the largest steel mill in the U.S.A. This plant loads products for export directly aboard ship at its own docks.

Represented in all principal cities of the world by offices and representatives of Bethlehem Steel Export Company

905E

Plastic Foams Find New Uses

PLASTIC FOAMS are moving into a wide range of new applications. First it was the urethanes. Now expandable polystyrene is making headway, sometimes in competition with polyurethane, more often as a substitute for glass, paperboard, various plastics.

Both styrene and urethane foams are finding profitable markets in packaging, insulation, toys, furniture, and building construction. Both can be either rigid or flexible, though flexible styrene is still in the testing stage.

• **Styrene** — The basic material for polystyrene foam is beads that expand when subjected to heat. Foaming normally consists of two steps: 1) pre-expansion of the beads; 2) further expansion in the confines of a mold. The virgin beads can be expanded directly into the mold, but pre-expansion is necessary when uniform or low densities are required.

Styrene foams have a closed-cell structure, controllable density, low thermal conductivity, and low water absorption. They are lighter than cleansing tissue, but have a tensile strength of over 2 kg per sq cm. They resist acids and do not embrittle at sub-zero temperatures.

These foams first found limited markets in insulation, containers, and packaging. Now bigger pieces are being made—3-meter pleasure boats, cones for loudspeakers, pipe coverings. A U. S. company soon may use styrene jars in place of glass for packing its cosmetics; the new jar will weigh one-tenth as much as glass, cost 20% less.

• **Urethane**—Polyurethane foam appeared on the market only five years ago, but it already has become one of the most popular petrochemical plastics. It can be made as a soft sponge, or as a rigid mold.

In its rigid form, it now is used extensively for packing and shipping. Sandwiched between two thin sheets of aluminum it becomes an effective structural panel, or a serving tray. It often is foamed in place (IMD, Dec '57), for insulating tanks and complex piping. (*Modern Plastics, June, p* 87; *Petroleum Week, June* 10, *p* 28)

Technology in Brief

Dyes in Situ: Certain types of dyes are converted to reactive dyes right on the textile fiber in a patented process developed by Imperial Chemical Industries Ltd., London. Goods are treated with a water-soluble heterocyclic compound, an alkali, and a dyestuff, and then dried and steamed at 100 C. to 130 C. (*Textile World, May, p*59)

Lift Truck: At right is a design of "things to come in materials handling" dreamed up by U.S.A.'s Automatic Transportation Co., which sees in the future smaller truck bases, higher lifts, attachments that duplicate the movements of the human arm. Trucks will be powered by fuel cells and greatly improved batteries. (*Purchasing Week, June* 27, *p*23)

Auto Exhausts: The 1961 Rambler will be equipped with an exhaust system that lasts a lifetime, according to American Motors Corp. Muffler and tailpipe will be dipped in a molten solution of borosilicates, clay, borax, titanium dioxide, and other refractory agents. When this mixture is fire-hardened at 800 C, it forms a ceramic coating that seems impervious to road salts and water-condensation acids. (*American Machinist/Metalworking Mfg., June* 13, *p*95)

Plastic Netting: A process for extruding polyethylene in net form has been developed by E. I. du Pont de Nemours, U.S.A. The netting, called Vexar, is produced in a single operation by special machinery developed in England. Strands can be made thicker than a pencil or as fine as coarse thread. The netting is used as a decorative jacket for bottles, and as a protective sleeve for machine parts. (*Modern Plastics, July, p*98)

Gas from Coal: A new continuous gasification process for making water gas from low-grade coal is under study at the London Research Station of Britain's Gas Council. Powdered coal is completely gasified by being forced into molten slag by oxygen or steam. The conventional water-gas process is cyclic rather than continuous. (*Chemical Week, June* 11, *p*81)

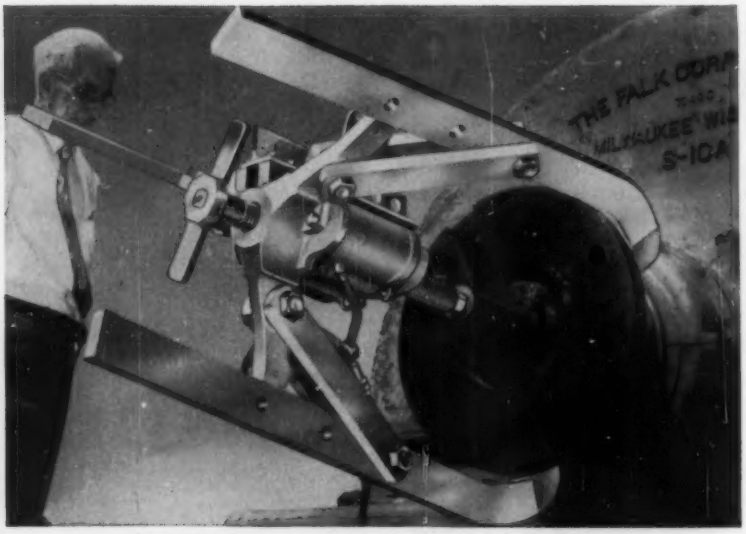
Brazilian Reactor: Brazil will invite bids this year for a 150-200-Mwe atomic reactor to be built on the Mambucaba river south of Rio de Janeiro. Operation of the plant will start "not before 1964." Note that at least 30% of the plant, valued at $45- to $60-million, will be manufactured in Brazil. (*Nucleonics, June, p*26)

Washing Insulators: A commercial dishwasher has been modified by Portland General Electric Co., U.S.A., to clean contaminated insulators—and save the company 3,000 man-hr a year. Small insulators are put through by the hundreds with no labor except for loading and unloading. Formerly the insulators had to be soaked in detergents and scrubbed. (*Electrical World, May* 2, *p*58)

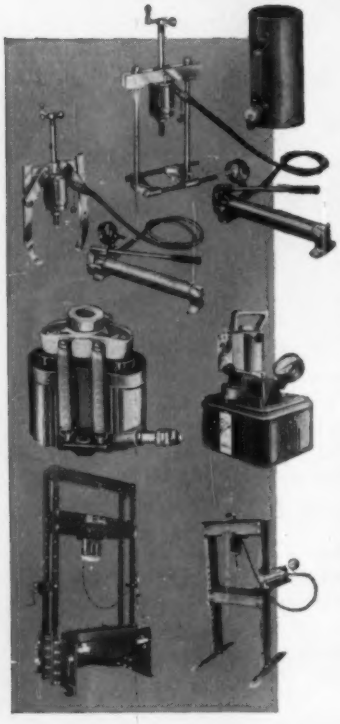
Hydrazine Cell: A fuel cell operating on hydrazine and hydrogen peroxide is under development at Britain's Chloride Electrical Storage Co. Ltd. The new system is said to be less bulky than the Bacon fuel cell and to operate at lower temperatures than some other cells now being developed. (*Chemical Week, June* 4, *p*58)

Electropolishing Tools: The Russians are using electropolishing to finish metal cutting tools. The process is reported to give close control over metal removal: it removes the surface skin of deformed metal without etching. (*American Machinist/Metalworking Mfg., May* 16, *p*59)

Gasoline from Gas: A group of U. S. petroleum companies now are recovering 1,000 bbl/day of gasoline and liquefied petroleum gas (LPG) from 5-million cu. m. of natural gas by dry-bed absorption. The large-scale unit is an outgrowth of a recent trend in natural gas production: producers' use of regenerative desiccant dryers to remove trace amounts of gasoline



Cut Maintenance Costs with Modern OTC Hydraulic Pulling Equipment



• REMOVE AND INSTALL GEARS, BEARINGS, WHEELS, PULLEYS QUICKLY AND SAFELY... AND WITHOUT DAMAGE TO PARTS!

Mr. Executive: As you well know, the elimination of unnecessary maintenance costs and loss of production time due to idle machinery is of vital importance to your entire operation! Solving tough maintenance problems is OTC's specialty! Wherever gears and wheels are turning, the versatile OTC "pulling-system" stands ready to handle the maintenance problems which arise — and handle them quickly, safely and easily without damage or distortion to parts.

Sizes are from 2 to 100 tons. Approval and endorsement by 28 major bearing, tractor and truck manufacturers is your best guarantee of high quality, expert design, long life and complete satisfaction. We cordially invite you to find out more about the time-saving OTC hydraulic "pulling-system."

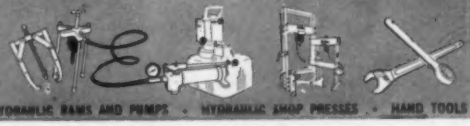
Write for free OTC Industrial Maintenance Equipment Catalog, No. P-9.

OWATONNA TOOL COMPANY

OWATONNA, MINNESOTA, U.S.A., CABLE ADDRESS: TOOLCO

RESEARCH · ENGINEERING · DEVELOPMENT · OTC

Designers and manufacturers of the world's most complete line of Maintenance Tools and Hydraulic Equipment.



PULLERS AND PULLER SETS · HYDRAULIC RAMS AND PUMPS · HYDRAULIC SHOP PRESSES · HAND TOOLS

so as to insure bone-dry gas. (*Chemical Week, May* 14, *p*118)

Explosive Forming: Engineers at Ryan Aeronautical Co., U.S.A., are attempting to explosively form superalloys and refractory metals while they are hot. Glass beads take the place of water for transmitting the explosive energy. (*Metalworking Week, June* 6, *p*97)

Machines That Hear: Scientists are making considerable headway in perfecting computers that can identify spoken language. Further progress is centered upon research in resonance, according to delegates at a recent meeting of the Acoustical Society of America. Human beings identify specific vowels by their resonance, irrespective of pitch, intonation, or volume. Getting a machine to do the same means classifying resonances in such a way that they can be expressed in mathematical language. Continuing research work is now aimed at establishing boundaries for the various vowel sounds. (*Business Week, June* 18, *p*119)

EMPLOYMENT OPPORTUNITIES

POSITION WANTED

General manager subsidiary ten years resident experience Latin America with well known American Corporations will consider possible change. PW-4688, International Management Digest, P.O. Box 12, New York 36, N. Y.

"Put Yourself in the Other Fellow's Place"

TO EMPLOYERS

TO EMPLOYEES

Letters written offering Employment or applying for same are written with the hope of satisfying a current need. An answer, regardless of whether it is favorable or not, is usually expected.

MR. EMPLOYER, won't you remove the mystery about the status of an employee's application by acknowledging all applicants and not just the promising candidates.

MR. EMPLOYEE you, too, can help by acknowledging applications and job offers. This would encourage more companies to answer position wanted ads in this section.

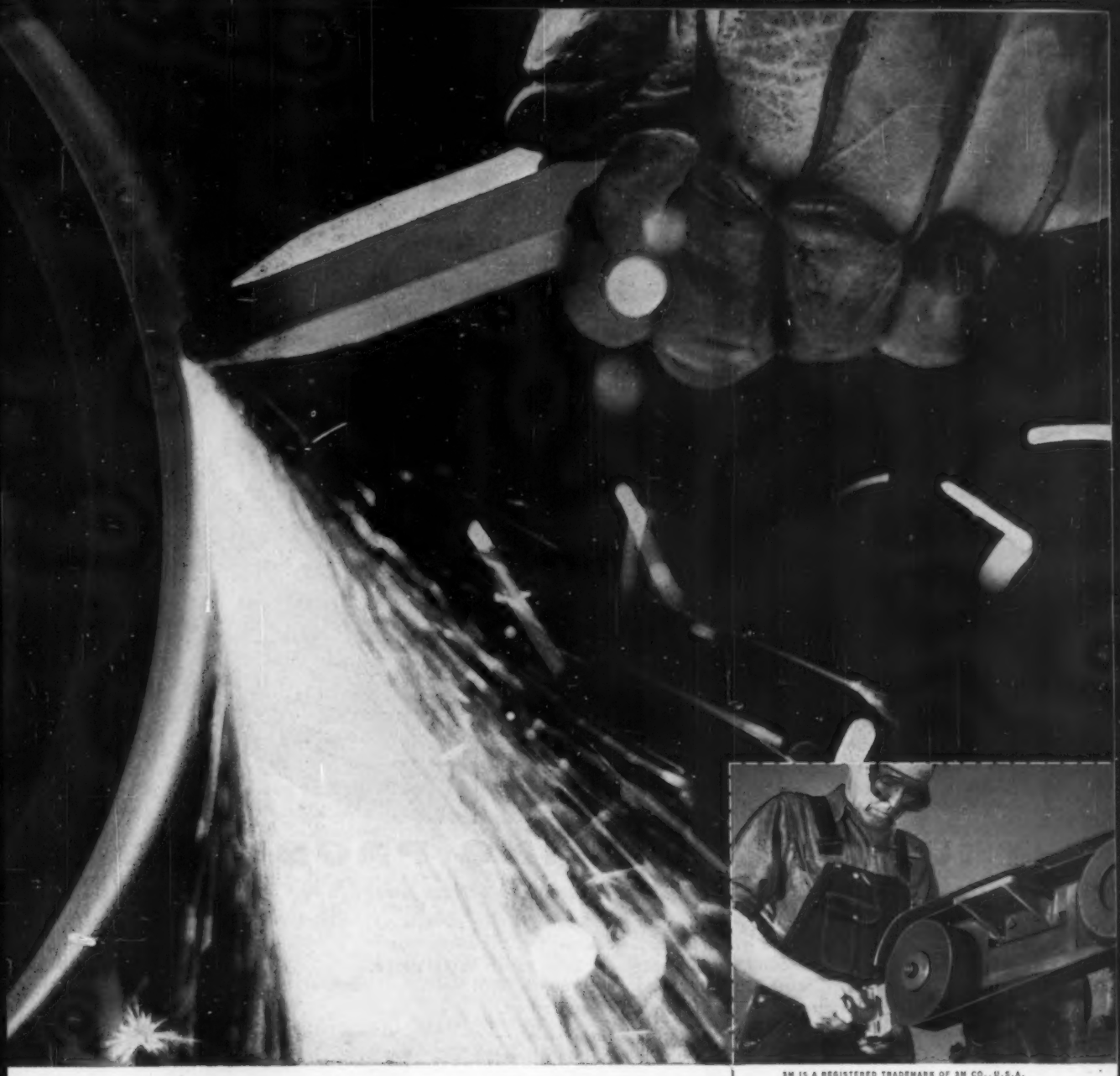
We make this suggestion in a spirit of helpful cooperation between employers and employees.

This section will be the more useful to all as a result of this consideration.

Classified Advertising Division

McGRAW-HILL PUBLISHING CO., INC.

330 West 42nd St., New York 36, N. Y.



3M IS A REGISTERED TRADEMARK OF 3M CO., U.S.A.

Versatile tool for industry... 3M Abrasives

Look first to 3M... nowhere in the world can you find more concentrated knowledge of industrial abrasives. 3M's extensive organization of abrasive engineers and unequaled laboratory facilities are at your service to show you where 3M Abrasives can improve your products and increase your profits.

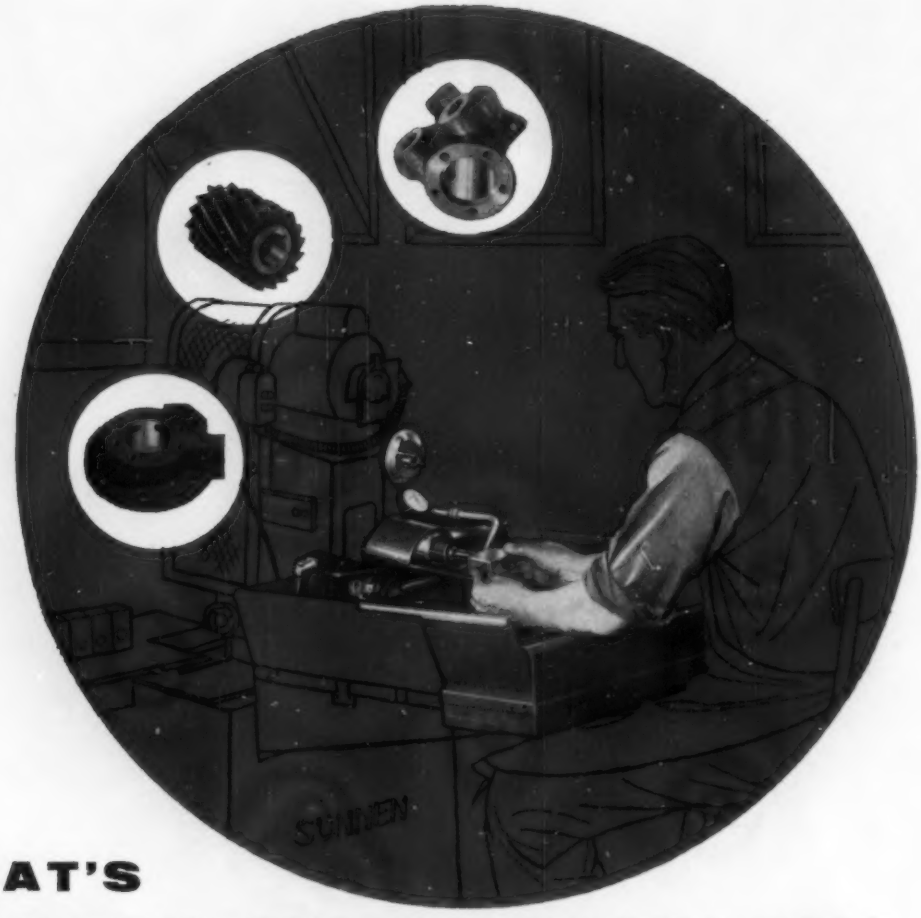
At 3M, research and application are limited only by human inspiration—inspiration that has created thousands of original and diverse products to benefit industry and business.

3M research may be *your* key to tomorrow.

3M COMPANY

WHERE RESEARCH IS THE KEY TO TOMORROW

For information about 3M products write: 3M Company, International Division, St. Paul 6, Minn., U.S.A.



WHAT'S YOUR BORE-SIZING PROBLEM?

Roundness? Straightness? Tolerances? Surface Finish?

Job lots or production runs . . . *Sunnen Honing* corrects all hole errors with minimum stock removal . . . eliminates out-of-round, chatter, waviness, bow, taper, barrel shape, bellmouth. Guarantees bore accuracy to .0001" with controlled surface finish as fine as desired.

From stock removal through finish sizing — from deburring through micro-fitting, Sunnen Honing is the most economical solution for internal work. No fixtures or time consuming set-up required; no chucking pressure to distort the hole.

Range .100" through 2.625" with standard tooling—and through 4½" with tooling built to order.

INVESTIGATE

the advantages of this versatile, low cost fast stock removal process. Ask us for descriptive literature.

THE SUNNEN® PRODUCTS COMPANY

7910 Manchester Avenue · St Louis 17, Missouri, U.S.A.

PRECISION HONING MACHINE • PORTABLE CYLINDER HONES • EXTERNAL HONES

The little radio is the symbol of how a skillfull nation has leaped to the forefront of world electronics . . .

. . . and it is being followed into world markets by portable TV, tape recorders, controls and instrumentation for science and industry as . . .

Electrons Build a New Japan

JAPAN HAD NO TV industry in 1952. Today it has 50 stations, televising to two-thirds of the nation.

Radio production has gone up from 5-million sets in 1958 to an estimated 13-million this year.

About 500,000 tape recorders now are in use in Japan, most of them made in the last two years.

Japanese laboratories are energetically pioneering new electronic tools for industry and science—computers, radar, microwave communications, devices that turn oral speech into typed copy.

• **Obstacles**—Japan's electronics industry has grown from infancy to adulthood in a few years despite major obstacles—poor natural resources, ten years of war, a postwar occupation policy that originally inhibited industrial growth, a chronic capital shortage.

Japanese industry is fantastically undercapitalized. For example, Toshiba produces $250-million of goods a year but its authorized capital was increased to $62.5-million only last year. And government policy has aggravated this capital shortage by discouraging private foreign investment.

• **One Big Jump**—These disadvantages have been offset by a determined, skillful, and industrious people, and the ability of Japanese industrial leaders to adapt themselves to changes in world technology and to rapidly rising living standards in many of its markets, at home and abroad.

To move fast, Japan marshaled its greatest resource—manpower, available at relatively low cost. This has been the decisive factor in the growth of electronics, which requires a higher proportion of fabrication talent and a lower proportion of raw material than many other industries.

Then too, Japan has been quick to use foreign technical aid. Companies have close links with U. S. and European technology. Usually these links are of a loose contractual nature—basic licensing agreements in exchange for a percentage of sales—but they have kept Japanese companies in the vanguard of technical development and enabled them to use their human talents to best advantage.

The growth of Japan's electronics industry has been aided by other factors: government protection from imports; technical advances that have permitted the building of small, inexpensive products; and the public's eager acceptance of television and electronics equipment.

I. A Consumer Industry

Japanese electronics is oriented almost exclusively to consumer goods and communications. Radio and television account for 40% of industry sales, communication equipment for another 25%.

Both of these have been helped along by the government. Tokyo authorities decided in 1952 that the nation needed a TV industry, and put the Japanese Broadcasting Co. in the TV business. Private competition is permitted, but with license fees for sets going to the government-financed corporation.

• **Bold Enterprises**—A number of bold entrepreneurs set out to compete. One of these—Matsutaro Shoriki, publisher of the Tokyo *Yomiuri*—bought 300 TV sets and put them in public places. They became so popular that traffic in Tokyo streets ground to a halt.

Promotion of this kind started the Japanese buying television. The first TV broadcast was in 1953, but by 1958 more than a million sets a year were being produced.

Prior to World War II, radio broadcasting was monopolized by the state-owned Nihon Hoso Kyokai (NHK). The field was opened to commercial enterprise in 1951. Today there are over 300 A.M. broadcasting stations, which reach 85% of the nation's households.

• **Millions of Radios**—Mass production of radios has followed, most of them now transistorized. Of 5-million radio receivers made in 1958, more than half were tiny portables using transistors. Last year's 10-million receivers were 80% transistorized.

But tube production has been mounting impressively, with increased output of table radios, auto radios, radio-phonograph combinations. And tape recorders, for both entertainment and office use, now are on the scene. A recent product show exhibited a dozen different midget models being groomed for local and foreign markets.

Transistors are the brightest field in Japanese electronics. A half dozen companies including some of the big tube manufacturers —Toshiba, Matsushita, Hitachi—now are producing more transistors of the entertainment type than any other nation in the world. And

JAPAN'S ELECTRONICS GROWTH
(in $1,000)

I. Industry Output

	1958	1960 (est.)
Radios	$87,783	$201,600
TV Receivers	156,640	406,000
Communication Systems	69,543	127,700
Measuring Instruments	14,073	24,920
Computers	1,190	2,380
Components	131,778	364,300
Other Equipment	33,509	102,300
Total	494,516	1,229,200

II. Component Output

	1958	1960 (est.)
Receiving Tubes	$36,820	$105,800
Cathode-ray Tubes	33,396	88,800
Transistors	21,524	62,700
Capacitors	16,848	44,800
Resistors	8,084	23,000
Transformers	8,266	22,400
Speakers	6,840	16,800

III. Exports

	1958	1959
Radios	$34,464	$108,090
TV Receivers	874	2,137
Communications	480	2,274
Tape Recorders	741	3,190
Measuring Instruments	378	397
Radiation Equipment	296	76
Electron Microscopes	225	693
Control Equipment	1,469	1,095
Tubes	2,348	4,261
TV Picture Tubes	11	37
Transistors	372	3,174
Capacitors	803	1,505
Microphones	291	468
Speakers	1,142	2,886
Magnetic Tape	69	117
Other Electronics	3,890	6,249
Total	47,853	136,649

these transistors are going into communications equipment, computers, and industrial controls as well as into consumer goods.

II. How It Started

The pattern for today's technical growth was set more than a century ago, when young Emperor Meiji was restored to power in 1858 and the nation opened its doors to western influence. Within a few decades, the Japanese had remodeled their government, their social structure, their economy, and created an impressive industrial base.

The Meiji Restoration created many of the conditions that still obtain in business today. The planners for the young emperor—a talented group of hitherto unemployed *samurai* — realized that Japan had to catch up in a hurry. They forced the growth of industries, banks, and commercial organizations. And they created the tradition of government control and protection that exists today.

• **Birth of the Zaibatsu**—By the time World War I was over, the business structure was marked by a dozen monolithic trusts, called *zaibatsu* (literally "money cliques"). They were giant family-owned aggregations of trading companies, shipping firms, light and heavy manufacturing industries—governed by a central family bank.

Japanese industry grew and prospered under the *zaibatsu*. These financial groups had to give ground to military influences during the Chinese hostilities and World War II, and at the war's end the Allies tried to dissolve them.

The *zaibatsu* came back into being because of Japan's chronic shortage of capital and its reliance on bank financing. Three of the pre-war giant *zaibatsu*—Mitsui, Mitsubishi, and Sumitomo—today are back in business.

• **Western Ties**—These and other *zaibatsu* financially control much of Japan's electronics effort. They might have a dampening effect on this effort—in view of a bank's inherent conservatism—if it were not for the many ties that Japanese companies have with U. S. (and some European) firms.

Hitachi, for example, is closely linked with Radio Corporation of America in most of its electronic activity. Toshiba has been identified with General Electric for many years. Both Shimadzu and Mitsubishi work with Westinghouse in the X-ray and instrument fields. Matsushita has connections with Philips Lamp of Holland.

The electronics industry in Japan is rather sharply divided into two groups of companies—based in two parts of the country. Companies centered around Tokyo are dominated by the old-school industrialists, whose policies sometimes inhibit the growth of electronics. The more aggressive Japanese electronics firms are in the west provinces, centered around Osaka and Kyoto. Electronics growth in this area has created a labor shortage, while Tokyo is crowded with unemployed young people.

III. Patterns of Growth

Though rooted in consumer products and communications, the Japanese electronics industry is beginning to show versatility and diversity. Industrial and medical applications are growing fast.

• **Electronic Fishing**—Navigation communications have been important in Japan for many years, since fishing is a major industry. VHF (very high frequency) radio equipment now is used for coastal and in-port services. Short wave is generally used by the fishing fleets.

Japanese electronics has pioneered in marine radar, where solid-state components have enabled eight or more companies to build small and relatively inexpensive shipboard installations. Airborne radar, however, is in its infancy.

Japan produced $11.2-million worth of industrial measuring instruments in 1958, about 60% of them electronic. Both sales and the electronics percentage increased in 1959. Products included a radiation thermometer using lead-sulfide photocell; an electromagnetic flowmeter; radio-isotope instruments.

Ultrasonics has been put to use in shoal-detectors for the fishing fleet, and in a variety of modern instruments—thickness gages, defect finders, boring, cutting, soldering and cleaning tools. Medical electronics has been moving fast in Japan. Ultrasonic techniques for studying eye lesions and measuring the depth of the eyeball are getting attention at Tokyo's Komagome

Hospital. Toshiba, Shimadzu, and Hitachi are making improved X-ray equipment. Hitachi and Japan Electronic Optical are prominent in electron microscopes.

• **Computers Too**—Several companies—Nippon Electric, Hitachi, Fuji Communications, Oki Electric—are producing parametron computers. But these systems are essentially scientific, rather than commercial. Only Oki's is a decimal computer, and none has commercial input-output facilities.

The inattention to input-output requirements arises in part from the cumbersome symbols in which the Japanese language must be written. It also results from the lack of management pressure: Recordkeeping is still largely a matter of pen and abacus.

Automation and automatic controls also are in their infancy, but the nation's laboratories may have much to say about the directions these technologies take five or ten years from now. Research goes ahead on a broad front—in components, materials, telecommunications, information theory.

• **Research**—Much of the advanced research work is done in government laboratories or by one of the big universities—Tokyo, Kyoto, Osaka, Nagoya. This work often ties in with key research being done by the smaller electronics firms. The big electronics companies lease more of their engineering than they perform.

There are many examples of advanced engineering. A few months ago, Apollo Industries demonstrated a dry-cell-powered 6-transistor audio amplifier that drives two 20-cm coaxial speakers. At Kyoto University, a research group is working on a "phonetic typewriter" that recognizes and prints spoken vowels.

IV. Marketing and Export

The newer electronics firms also have been the pioneers in modern marketing in Japan. Several have turned to English-language trademarks—Yaou's "General", Hayakawa's "Sharp", Fukuin's "Pioneer". Matsushita ("National") has opened a nationwide network of retail outlets and service centers, and its big competitors now are doing the same.

Advertising and public relations

have boomed as the industry stopped dividing up its markets by "gentleman's agreements." The most sophisticated marketing techniques may not be common, but a foundation for modern competition has been laid.

The main areas in which Japan's electronics industry hopes to compete abroad are consumer goods and components. Industrial instrument-making also is coming along, and eventually the Japanese may be a competitor in automatic controls.

• **Competition with the West**—Japan's rapid electronics progress means competition for the West, but it is a complex problem. U.S. and European governments feel strongly that Japan must be kept in the Western industrial and technological community, and they are struggling to find ways of integrating it painlessly into the Free World's industrial foundation.

Most Japanese industrial leaders also realize that their futures lie in Western trade. But their approach is pragmatic: They will trade where they can. If Europe and the Western Hemisphere barricade themselves against Japanese goods, they will trade with what is left.

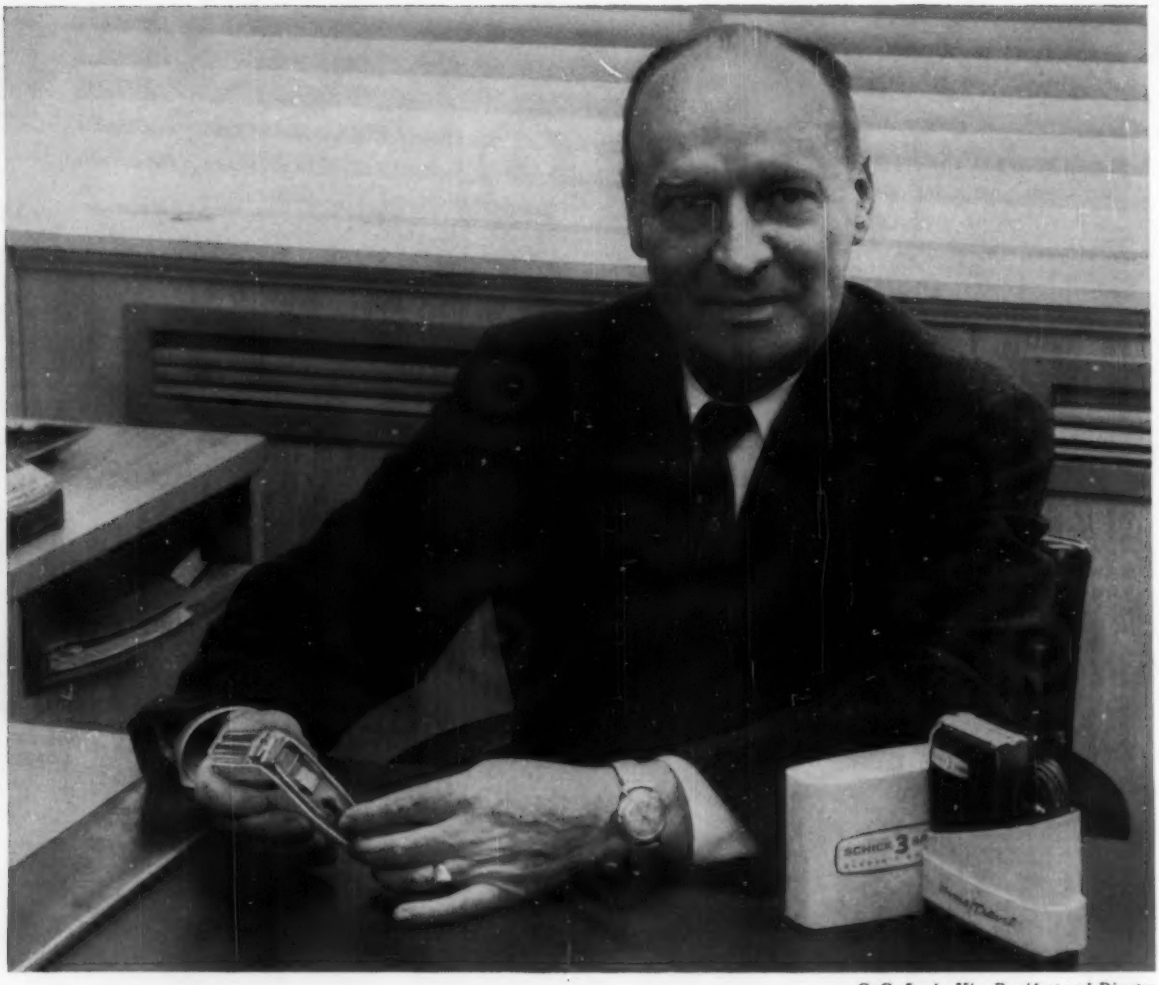
World trade works both ways, and many Japanese industrialists are aware that to expand their markets abroad—and even to maintain them—they must liberalize trade policies at home.

• **Liberalized Trade**—The Japanese government's present plan is to break down trade barriers gradually, taking into consideration the competitive power of domestic industry. The program would withdraw 90% of Japan's import curbs within the next three years.

An even more significant move would be the encouragement of foreign capital investment by the relaxation of controls over currency flow. The big banks oppose this move, because an influx of new capital would tend to lower interest rates and hurt bank business.

In the meantime, U.S. action against electronic imports from Japan appears unlikely. Too many American firms have a financial stake in Japan's industry.

Japanese electronics success is even meeting imitative competition. Tokyo's Kataoka Electric, which makes capacitors under the tradename "Alps," recently discovered that an Indian company is marketing an almost idential product with the tradename "Alpes". Sony has met similar competition in Europe—and has even built a plant there to be closer to the market. (*Electronics, May 27, p 53*)



C. C. Lewis, Vice President and Director of Purchasing, Schick, Inc.

"When I buy components...
I look for DEPENDABILITY"

. . . says Mr. C. C. Lewis, Vice President and Director of Purchasing for Schick, Inc., shown with Schick's 3-Speed electric shavers. "Dependability is our key in choosing a supplier. We look for products dependably *engineered* for top performance . . . dependably *tested* for complete quality control . . . with dependable, on-time *deliveries* . . . from companies interested in helping maintain dependability *in our product*. We've found Mallory a dependable source of electrical contacts and ceramic capacitors for over 10 years."

P. R. Mallory International Inc.
Indianapolis 6, Indiana

P.R. MALLORY & CO Inc.
MALLORY

See MALLORY for:

- Mercury and Zinc-Carbon Batteries
- Capacitors
- Controls
- Timer Switches
- Vibrators
- Contacts
- Special Metals
- Electronic Assemblies
- Welding Materials

● PRODUCT DIGEST

High-Style Hi-Fi

Unusual styling is not the only characteristic of this Swedish hi-fi system, designed by Count Sigvard Bernadotte. The walnut cannon-shaped speaker shoots sound to all directions of the room from its top and from the four openings on its sides. And because an amplifier is built into it there is no distortion of sound, it is claimed. Also, two speakers can be joined to provide stereophonic listening with "no hole in the middle"—true spherical radiation of sound with, according to the company, "markedly increased technical efficiency, high acoustic power capacity, and low intermodulation distortion." *Electron Lund AB, Malmo, Sweden.*

Portable Typewriter Has Plastics Housing

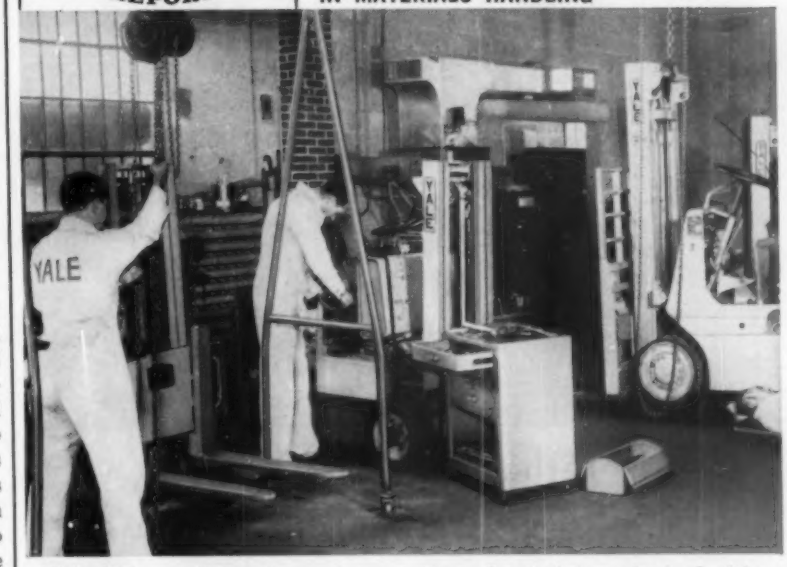
Plastics have been chosen for the housing of Remington Rand's latest portable typewriter. The advantages—lighter weight, greater scope for design, sales appeal—are obtained at no extra cost.

Unlike some previous experiments with plastics typewriters, the Quiet-riter Eleven has been well received by consumers. And the plastics industry is gleeful, according to *Modern Plastics*, that this "last major bastion of resistance in the office equipment field" has finally fallen to the idea of plastics housings (following adding machines, photocopiers, and the like).

The whole casing of the machine is molded in six parts of ABS polymer. It has a smooth, scratch-resistant finish, resists marking by inks, type cleaners, carbons, etc., and comes in six colors. *Remington Rand Intl., 315 Fourth Ave., New York 10, N. Y., U.S.A.*

WORLD YALE & TOWNE REPORT

YALE'S WORLDWIDE SALES AND SERVICE ORGANIZATION ASSURES YOU GREATER EFFICIENCY IN MATERIALS HANDLING



Yale Sales and Service representatives, located in principal cities around the world, assure you of the finest in materials handling equipment. They offer you the widest line of industrial lift trucks to meet every handling need.

And, just as important as the quality of these trucks is the high caliber of service they provide to save you many hours of costly downtime. Trained personnel are on hand to service your Yale equipment promptly and efficiently . . . with minimum delay.

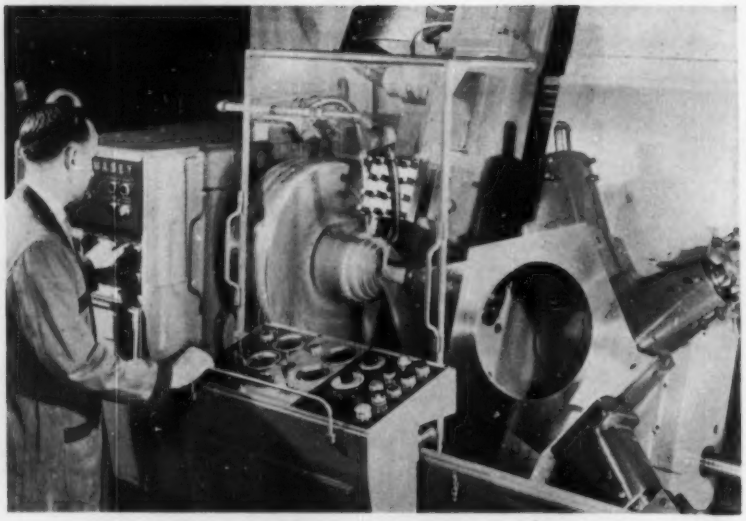
Remember, only Yale can offer the complete line of materials handling equipment to meet your every need. Contact the Yale Sales and Service representative nearest you for further information.

Australia, Adelaide	APAC Industries, Ltd.	**Malaya, Kuala Lumpur**	The Borneo Company, Ltd.
Austria, Vienna	Gebruder Gröh	**Morocco, Casablanca**	Forges de Bazas
Belgium, Liege	Fenwick S.A. Belge	**New Zealand, Christchurch**	A. M. Satterthwaite & Co. Ltd.
Denmark, Copenhagen	V. Lowener		
Egypt, Cairo	El Alamia Trading & Industrial Co.	**Norway, Oslo**	A/S Lowener, Mohn
Finland, Helsinki	Oy Machinery AB	**Pakistan, Karachi**	J. Tyler & Co. Ltd.
Greece, Athens	The Hellenic Technical Supply Co.	**Philippines, Manila**	Edward J. Nell Co.
Holland, Vlaardingen	L. A. Van Eijle & Co's.	**Portugal, Lisbon**	Henry M. F. Hatherly, Ltda.
India, Bombay	Voltas, Ltd.	**Rhodesia, Bulawayo**	D. Drury & Co. (Rhodesia) Ltd.
Iran, Teheran	Sabet-Pasal Co. Inc	**Spain, Barcelona**	S.A.M. Fenwick
Ireland, Dublin	Blackwood Hodge (Ireland) Ltd.	**Sweden, Stockholm**	A-B V. Löwener
Israel, Tel Aviv	Automotive Equipment Ltd.	**Switzerland, Zurich**	Forrer-Fenwick S.A.
Italy, Milan	Fenwick S. Per A.	**Turkey, Ankara**	Kac Ticaret T.A.S.
Japan, Tokyo	Kiichi Harada & Son	**Union of South Africa, Johannesburg**	Drury Wickman Ltd.
Korea, Seoul	American Trading Co.		

- Yale makes the world's most complete line of petrol, LP-gas, electric, diesel and hand lift trucks.
- All Yale industrial lift trucks are uniformly high in quality, wherever manufactured.
- All Yale equipment available in currencies of the free world.
- For further information contact your Yale sales and service representative—located in principal cities of the world.

YALE®
INDUSTRIAL LIFT TRUCKS
TRACTOR SHOVELS
YALE & TOWNE

The Yale & Towne Manufacturing Company, Chrysler Building, New York, U.S.A.
Manufacturing Plants: Velbert Rhld., Germany • Wednesfield Staffs., England • Phila., Pa., U.S.A.
Licensed Manufacturer: FENWICK—Saint-Ouen, Seine, France • Milan, Italy • Barcelona, Spain



Lathe With a Memory

This numerically controlled turret latne has its own electronic memory, designed to store and recall the sequence of commands of any machining cycle and to put the various feeds and motions into action automatically. The controls are all-electric. The operator's console has no handwheels and the dial indicators showing turret movements are built into the console.

No outside programming is needed. The operator runs through a machining cycle on manual control and after each acceptable cut simply pushes a button to record the action in the memory. Feed, speed, start-of-cut, length, and dimension on the work are then permanently recorded. There is also provision for changing individual commands as tool wear, or some such factor, dictates. *Warner & Swasey, 5700 Carnegie Ave., Cleveland, Ohio, U.S.A.*

Midget Refinery

Portable refineries and topping units are becoming increasingly popular with petroleum producers. In Africa or Latin America, especially, they are regarded as a happy solution for companies that have to handle crude at high cost and under difficult conditions in remote areas.

The latest example of this trend is a small skid-mounted unit designed for work in Argentina. It has a dual purpose—to provide fuel, and to help in determining the refining qualities of the crude the company is recovering. The unit is gas-fired, air-cooled, completely self-sufficient, and carries its own generators to power its electrically driven pumps. *Williams Bros., Tulsa, Okla., U.S.A.*

In Brief . . .

Minnesota Mining & Mfg. Co. (900 *Bush Ave., St. Paul* 6, *Minn., U.S.A.*) have a new line of structural adhesives—thermosetting film and liquid epoxies—for bonding castings, tubing, gear assemblies, etc. . . . Electronic oven uses microwave technique to heat up prefrozen meals in eight minutes. *Philips Lamp, Eindhoven, Netherlands.*

ADVERTISERS

in this issue

OVERSEAS EDITION

ADDO, AB 44
Agency—AB Wallin—Reklam Aukt, Annonsbyra

ALCOA INT'L INC. 23
Agency—Fuller & Smith & Ross, Inc.

ALLIS-CHALMERS INTERNATIONAL 7
Agency—Bert S. Gittens Adv.

AMCEL COMPANY, INC. 60
Agency—Ellington & Co., Inc.

AMERICAN AIR FILTER CO., INC. 30
Agency—Doe-Anderson Adv.

BANK OF AMERICA ..... 2nd C.
Agency—Johnson & Lewis, Inc.

BELL & GOSSETT COMPANY 27
Agency—Perrin-Paus Company

BELLOWS-VALVAIR DIVISION OF IBEC ... 59
Agency—Ralph Gross Adv., Inc.

BETHLEHEM STEEL EXPORT CORP. 48
Agency—Gotham-Vladimer Adv., Inc.

BRITISH OVERSEAS AIRWAYS CORP. 10
Agency—Foote, Cone & Belding, Ltd.

BUNDY TUBING COMPANY ..... 4th Cover
Agency—Brooke, Smith, French & Dorrance, Inc.

BURROUGHS CORP. 20
Agency—J. Walter Thompson

CHAIN BELT CO. 36
Agency—Buchen Co.

CHRYSLER INTERNATIONAL, S. H. 8
Agency—Publicontrol S. A.

CIMEX FRASER TUSON, LTD 46
Agency—City & General Adv., Ltd.

CLARK EQUIPMENT INT'L., C. A. 7
Agency—Marstellar, Ricard, Gebhardt & Reed, Inc.

CLEVELAND TRENCHER CO. 33
Agency—Meermans, Inc.

CYANAMID INTERNATIONAL 32
Agency—Foreign Adv. & Service Bureau

DAIMLER-BENZ, A. G. 31
Agency—Heumann, Werbegesellcraft MBH

FORD MOTOR CO., LTD 38
Agency—Rumble, Crowther & Nicholas, Ltd.

FORD-WERKE, A. G. 34-35
Agency—J. Walter Thompson GMBH

GARDNER-DENVER CO. 45
Agency—Buchen Co.

GENERAL ELECTRIC CO 47
Agency—Gotham-Vladimir

GENERAL ELECTRIC CO., INT'L 61
Agency—Grant Adv., Inc.

GENERAL MOTORS OVERSEAS OPERATIONS 43
Agency—Robert Otto & Co., Inc.

HENRY VALVE CO. 29
Agency—Hudson & Assoc., Inc., Raymond C.

HITACHI LTD. 9
Agency—Dentsu Adv. Ltd.

HYSTER CO. 62
Agency—Cole & Weber

MALLORY & COMPANY, INC., P. R. 56
Agency—The Aitkin-Kynett Co.

MINNESOTA MINING & MFG. CO 51
Agency—Batten, Barton, Durstine & Osborn, Inc.

NATIONAL BROACH & MACHINE CO 13
Agency—Witte & Burden Adv.

NORDBERG MFG. CO. 37
Agency—Russell T. Gray, Inc.

OWATONNA TOOL CO. 50
Agency—E. T. Homeren, Inc.

PINTSCH BAMAG A. G. 14
Agency—Adverta

POLYMER CORP., LTD ..... 3rd Cover
Agency—Stanfield, Johnson & Hill, Ltd.

REPUBLIC STEEL CORP. 12
Agency—Meldurn & Fewsmith, Inc.

SHELL INT'L. CHEMICAL CO., LTD 5
Agency—Auld & Tilbury, Ltd.

SUNNEN PRODUCTS 52
Agency—H. George Bloch, Inc.

WAUKESHA MOTOR CO. 42
Agency—The Cramer-Krasselt Co.

WESTINGHOUSE ELECTRIC INT'L CORP. 24-25
Agency—Gotham-Vladimir Adv., Inc.

YALE & TOWNE MFG. CO 57
Agency—Erwin Wasey, Ruthrauff & Ryan, Inc.

YODER COMPANY 49
Agency—G. M. Basford Co.

SALES REPRESENTATIVES

New York 36.....K. P. Bliss, D. L. Trimble, 500 Fifth Avenue
Boston 16.....350 Park Square Bldg.
Chicago 11.....J. P. MacLeod, A. Burgett, 520 N. Michigan Avenue
Cleveland 13.....W. S. Bliss, 1164 Illuminating Bldg.
Detroit 26.....Lee Cashin, 856 Penobscot Bldg.
Philadelphia 3.....D. L. Trimble, 6 Penn Center Plaza
Pittsburgh 22.....W. S. Bliss, 919 Oliver Bldg.
St. Louis 8.....A Burgett, 3615 Olive Street
Atlanta 3.....M. H. Miller, 1301 Rhodes-Haverty Bldg.
Los Angeles 17.....W. Gries, 1125 West 6th Street
San Francisco 4.....J. J. Hernan, 68 Post Street
Dallas 1.....F. E. "Gene" Holland, 1712 Commerce Street
Denver 2.....J. W. Patten, 1700 Broadway
Germany.....S. Kimes, McGraw-Hill Publishing Co., Inc., 85 Westendstrasse, Frankfurt am Main
Switzerland.....M. R. Zeynel, McGraw-Hill Publishing Co., Inc., 2 Place du Port, Geneva
United Kingdom.....Edwin Murphy, McGraw-Hill House, 95 Farringdon St., London, E.C.4.

THE ONLY AIR CYLINDER WITH A CHOICE OF BUILT-IN VALVES

In designing for air operation, the engineer can choose the method of valving he prefers—and still have all the advantages of integral valve and cylinder construction.

Six different built-in valve arrangements give the engineer every latitude in pneumatic design.

If he prefers to use 8-12 volt electrical control with its simplified wiring, Bellows has it. If he prefers to use 115 volt control and JIC standards, Bellows has it. If he requires low or high voltage explosion-proof control, Bellows has it. Should his design require full pneumatic control, Bellows has it. Or should he wish to control his pneumatic circuits manually or through mechanical linkage or cams, Bellows has it.

Unlike conventional air cylinders which require separate remote directional and speed control valves and dual piping, the Bellows Air Motor is a complete power unit with directional valve and dual speed control valves built-in as an integral part of the unit. Only one air connection, which can be made with flexible hose, is required.

Integral valve and cylinder construction means quick response, more positive response, more precise control and more economical operation.

The Bellows Air Motor is made in five bore sizes: 1¼", 1¾", 2½", 3⅝", and 4½", and in any stroke length.

***WRITE FOR THIS BULLETIN* TODAY!**

Four-color, 20-page bulletin describes the complete line of Bellows Air Motors. Free on request. Address Dept. IMD-860, Bellows-Valvair, S. A., Division of IBEC, S. A., 1 Rue de Chantepoulet, Geneva, Switzerland. In Great Britain and the Sterling area: Bellows-Valvair, Ltd., Division of IBEC, S. A., Birmingham, England.

627C-4

Bellows-Valvair

Bellows-Valvair, S.A. Division of IBEC, S.A., Geneva, Switzerland
Bellows-Valvair, Ltd., Division of IBEC, S.A., Birmingham, England

AMCEL

WORLDWIDE SUPPLIER OF FIBERS

Look to Amcel for:

Fibers

- Acetate (filament, staple, spun)
- Arnel Triacetate (filament, staple, spun)
- Solution Dyed Acetate
- Type F Acetate Staple
- Acetate Carpet Fiber
- Type K Acetate Staple
- High Tenacity Rayon
- Rayon
- Cellulose Acetate

Plastics

- Cast Acetate Film and Sheet
- Extruded Acetate Film and Sheet
- Cellulose Acetate Molding Compounds
- Cellulose Propionate Molding Compounds
- Polyvinyl Acetate Emulsions
- Low Pressure Polyethylene Molding Materials
- Polyester Resins

Chemicals

- Acids
- Aldehydes
- Lactones
- Polyols
- Vinyl Monomers
- Acrylates
- Alcohols
- Esters
- Glycols
- Ketones
- Plasticizers
- Functional Fluids

AMCEL AT YOUR SERVICE IN:

- Australia
- Austria
- Belgian Congo
- Belgium
- Burma
- Ceylon
- Denmark
- Egypt
- England
- Finland
- France
- Greece
- Holland
- Hong Kong
- India
- Israel
- Italy
- Japan
- Korea
- Lebanon
- Mexico
- Morocco
- New Zealand
- Norway
- Pakistan
- Philippines
- Portugal
- Rhodesia
- South Africa
- Spain
- Sweden
- Switzerland
- Syria
- Taiwan
- Turkey
- West Germany

ARNEL . . . a carefree Amcel fiber

Countless textile constructions call for the easy-care fiber—*Amcel Arnel triacetate.*

Fabrics of Amcel Arnel are outstandingly wrinkle-resistant, easy to launder and quick-drying. Arnel is a favorite fiber for men's, women's, and children's wear—resort and travel fashions, lingerie and decorative fabrics.

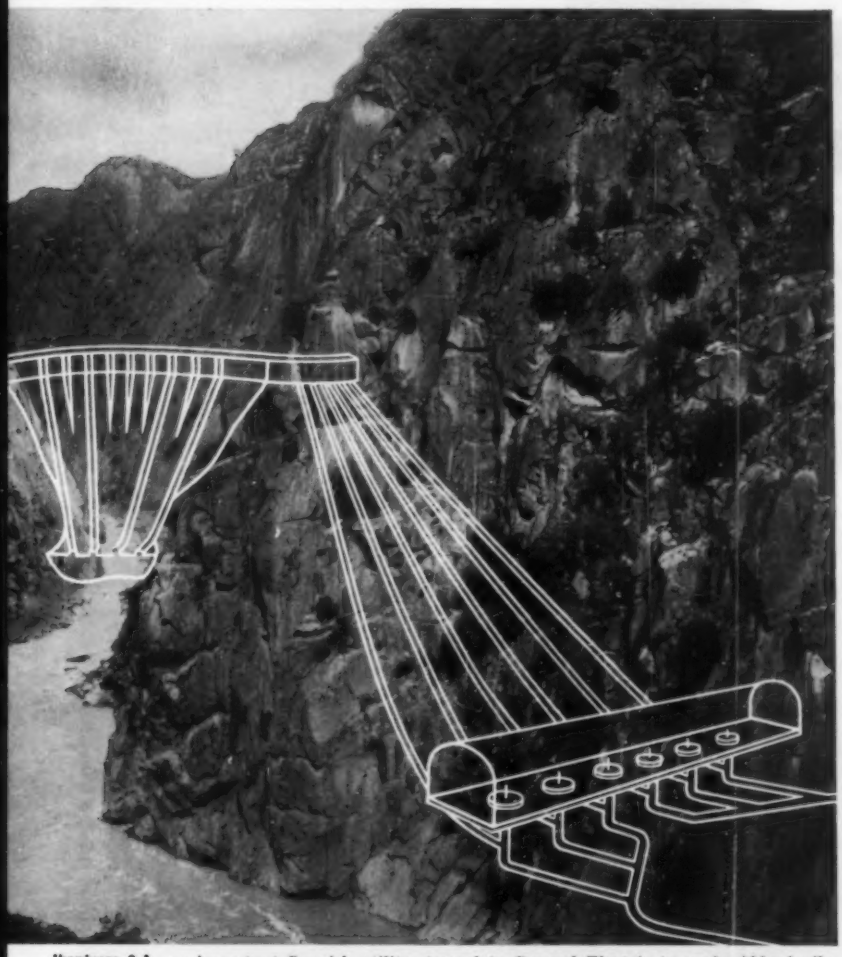
Amcel Arnel is available in filament, staple and spun. Amcel representatives throughout the world are ready to serve you, and offer experienced technical assistance with applications.

Amcel, Arnel, Type F and Type K are trademarks.

AMCEL CO., INC.

180 Madison Avenue, New York 16, N.Y. • Affiliate of Celanese Corporation of America

Tame A River Or Harness The Atom...General Electric Equipment Can Help Countries To Put Their Natural Resources To Work



Iberduero S.A., an important Spanish utility, turned to General Electric to equip Aldeadavila, Europe's largest underground power plant. When Aldeadavila is in full operation, it will have a total installed capacity of 756,000 kva. Six G-E 126,000 kva hydraulic-turbine driven generators, switchboards, control desks and excitation and regulation equipment are among the products General Electric has supplied for this great station.

G.E. provides the dependable products that are needed for industrial expansion and economic growth

Today, modern power facilities play an important role in the development of a country's natural resources.

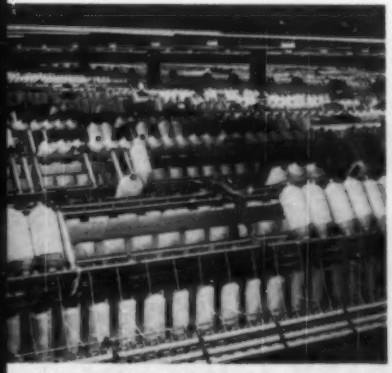
At Volta Redonda, South America's largest steel mill, the addition of a new 3-stand tandem cold strip mill equipped with reliable G-E main drive motors will help produce 1,250,000 tons of steel annually for Brazil. In Peru, General Electric metal-clad switchgear contributes to the smooth operation of the giant Toquepala copper mine. And people all over the world may benefit from G.E.'s current research on sea water demineralization—a process to increase the world's fresh water supply by removing salt and other minerals.

Exhaustive research, engineering thoroughness and careful pre-testing assure optimum performance and minimum maintenance for every type of G-E equipment. Let General Electric assist you now with modernization plans, expansion and your everyday electrical equipment needs. For more information about the G-E equipment to help you in your industry write: *International General Electric Co., Dept. 70-14M, 150 East 42nd Street, New York 17, New York, U.S.A.*

Progress Is Our Most Important Product

GENERAL ELECTRIC

—U.S.A.—



G-E Electrical Equipment keeps this large Philippine textile mill operating at peak efficiency. Owned by General Textiles Inc., the mill is equipped with 50,000 spindles, 1000 looms and a complete finishing plant. The power distribution and electrical auxiliary equipment was supplied by G.E.

Near Naples, Italy, the 150,000 kw Garigliano Nuclear Power Plant now under construction for the Societa Elettronucleare Nazionale (SENN) will utilize a G-E dual-cycle boiling water reactor. It is scheduled for completion in 1963. Design of the plant allows for possible increase of kilowatt output without major reactor changes.

The New York Times specified a General Electric drive system for its high-speed rotary presses. Advantages include smoother acceleration and deceleration, preventing costly paper tears...over 35% power saving...and substantial saving of water in the cooling system.

HYSTER

Low Cost Rock Crushing —

HYSTER® has it!

Hyster "Grid" Roller reduces the cost of your base and surface courses.

Use close-at-hand, pit-run rock crushed on the road bed with "Grid" Roller.

Engineered for long service life under toughest job conditions, "Grid" Roller brings new economy to road building.

Ask your Caterpillar-Hyster Dealer for Job Reports No. 30, 36, 38 and 57, or write to Hyster Company, Peoria, Illinois.

INTERNATIONAL DIVISION—Overseas manufacturing, sales and service
TRACTOR EQUIPMENT DIVISION—Construction and logging equipment
INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers

Factories: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill. • Nijmegen, The Netherlands • Glasgow, Scotland • Sao Paulo, Brazil • Sydney, Australia (Licensee)

HYSTER

HYSTER COMPANY
INTERNATIONAL DIVISION
P.O. Box 328 • Peoria, Illinois, U.S.A.

INTERNATIONAL MANAGEMENT'S

Recommended Reading

Preparing a Mailing List?

The Guide to American Directories lists over 2,000 trade, industrial, professional and business directories including titles, publishers, prices, description of contents, cross indexes. There is also an international section. 448 pages, $20. (B. Klein & Co., 27 East 22nd Street, New York 10, N. Y., U.S.A.) . . . A Guide to Foreign Business Directories provides the same information on directories published in or dealing with countries of the free world. 132 pages, 45¢. (Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., U.S.A.)

Today's Corporate Enterprise

The Meaning of Modern Business—an "engrossing and scholarly book" by Richard Eells—analyzes modern business: its present realities and future implications; discusses the goals, policies and complex relationships facing the modern corporation. $7.50. (Columbia University Press, 2960 Broadway, New York 27, N. Y., U.S.A.)

Work Study . . .

. . . by R. M. Currier, is a complete and authoritative work on the subject. There are chapters on the historical background to work-study techniques, purposes, functions. 232 pages, 22s.6d. or $3.15. (Sir Isaac Pitman & Sons, Ltd., Pitman House, Parker St., Kingsway, London WC2, England.)

The Future of Capital Goods Marketing

The April 1960 issue of the Capital Goods Review published an interesting and informative article by Richard R. MacNabb entitled Major Problems and Opportunities in Capital Goods Marketing During the Decade of the Sixties. Single copies are available at 25¢. (Capital Goods Review, Machinery & Allied Products Institute, 1200 Eighteenth Street N.W., Washington 6, D. C., U.S.A.)

What Makes People Buy?

The New Psychology of Selling, by Melvin S. Hattwick, explains in detail the changing methods of today's selling. It outlines the results of current psychological research applied to selling, and gives examples of how these methods have been used profitably. 276 pages, $5.95. (McGraw-Hill Book Co. Inc., 330 West 42nd Street, New York 36, N. Y., U.S.A.) . . . Salesmanship, edited by Drs. Steven J. Shaw and Joseph W. Thompson, is a collection of articles by marketing experts, giving their views on the art of successful selling. 419 pages, $4.25. (Henry Holt & Co., Inc., 383 Madison Avenue, New York, N. Y., U.S.A.)

More from McGraw-Hill

New Processes and Technology is a handy review of the most significant technical developments in the chemical process industries, 1958-1959 (free as long as our supply lasts.) . . . The Text Film Catalog 1959-1960 provides a complete listing of McGraw-Hill educational films (some available in Spanish) on salesmanship, personnel and industrial management, labor and management. (International Management Digest, 330 West 42nd Street, New York 36, N. Y., U.S.A.)

INTERNATIONAL
MANAGEMENT'S

Personal Business

Hints on Meeting the Press

Don't despise the reporter or mistrust him unduly. Press relations are becoming increasingly important to businesses everywhere. A "good press" can be a means of promoting new products and gaining new customers. And it enables a company to build up a reputation with financial interests, make itself known nationally and internationally.

Rule number one: Avoid being either too cautious or too outspoken with newsmen. In the one case you get a sterile story, in the other you get embarrassment, and risk having to say: "I was misquoted."

In dealing with reputable reporters, be candid, informal, and generous with your time. Your attitude somehow helps to set the tone of the story.

Entertaining newsmen lavishly and offering gifts is wisely avoided. And never broach the subject of advertising with newsmen. If you place ads and feel that certain editorial consideration is justified, the paper's business manager is the man to talk to, not the editor or reporter.

Don't try to have a story played down, except in the direst circumstances. Your best intentions can be misconstrued by the press. And if the item does get in, the write-up is apt to stress the very impression you wanted to avoid.

On the other hand, if you give a reporter a weak story, you will get a weak presentation that won't impress anyone. Readers can easily spot a piece of publicity "puffery."

"Leaking" a story (giving it to a news friend to pass along anonymously) can be quite dangerous if mishandled. Be very prudent in selecting your newsman; also keep your story simple, clean-cut, and pointed. Thus, you guard against the distortions of hearsay.

It is best to avoid off-the-record statements of the "don't use this" type. On the other hand, it is perfectly legitimate in some cases to give facts and then say: "You can use this, but don't mention my name." Also, make it clear if you prefer not to be quoted directly in anything you say. Double check important facts with the reporter before he leaves, but try not to ask to see his final story.

Folding Office: for the businesman who has lots of homework but doesn't want to clutter up the house with it. Disguised as a plain wooden cabinet, the unit unfolds like a cocktail cabinet to reveal a writing space with a drawer below it, plenty of shelves, and a recess large enough for a portable typewriter. At the bottom left-hand corner is a filing unit. There is also a fitted lamp. The miniature office is made of mahogany and birch wood, by a Norwegian manufacturer.

RUBBER RESEARCH—COMING TO YOU ON THE NEXT FLIGHT

ARE YOU LOOKING for new raw materials to improve your products—give you ideas for new products? Help is only an air flight away. Polymer's world-wide technical service can bring you a representative who is an expert on Polysar* rubbers—and who can call on an extensive research organization which is geared to evaluate product and compounding problems.

Manufacturers are finding that the wide range of Polysar rubbers provides an amazing diversity of product values. One of these versatile elastomers may provide the qualities you need to improve your processing . . . or assist you in the development of a new or better product. No matter where you are in the world, a Polymer representative can help you. A letter to the Marketing Division, Polymer Corporation, Sarnia, Canada, will put him in touch with you.

POLYMER CORPORATION LIMITED
POLYSAR
SARNIA CANADA

*TRADE MARK REG'D.

ONE OF THE WORLD'S MAJOR SOURCES OF RUBBER

Rugged Cummins Diesels give these huge Mack dump trucks 300 hard-working horsepower for hauling 30-cubic-yard loads of ore down Cerro Bolivar, Venezuela's iron mountain. Mack uses Bundyweld for brake and hydraulic lines; Cummins for vital fuel lifelines.

Venezuela's mighty mountain-movers rely on lifelines of Bundy Tubing

HAULING IRON ORE down a mountain all day is a rugged, truck-killing job. That's why every component on these Mack trucks and their Cummins Diesels must be extra-tough, extra-reliable. And that's why Cummins Engine Company, Inc., and Mack Trucks, Inc., like so many other manufacturers, specify lifelines of Bundyweld® Steel Tubing.

The original manufacturing process shown below is the big reason Bundyweld fuel, oil, brake, and hydraulic lifelines are used in *most of today's cars and trucks*. It also helps explain why Bundyweld Tubing is the standard of the refrigeration industry.

Designers the world over constantly find new uses for Bundyweld Tubing—in both fluid transmission and mechanical applications. If you need tubing with high strength, ductility, and low cost . . . it will pay you to use Bundyweld Tubing and Bundy's expert engineering service. Wire us today, or cable BUNDYTUBE.

BUNDY TUBING COMPANY
Detroit 14, Michigan, U.S.A.

WORLD'S LARGEST PRODUCER OF SMALL-DIAMETER TUBING. AFFILIATED PLANTS IN AUSTRALIA, BRAZIL, ENGLAND, FRANCE, GERMANY, AND ITALY

WHY BUNDYWELD IS BETTER TUBING

Bundyweld starts as a single strip of copper-coated steel. Then it's . . .

continuously rolled twice around laterally into a tube of uniform thickness,

and passed through a furnace. Copper coating fuses with steel. Result . . .

Bundyweld, double-walled and brazed through 360° of wall contact.

BUNDYWELD® TUBING

DOUBLE-WALLED FROM A SINGLE STRIP

- Sizes up to 5/8" O.D.
- Leakproof
- High thermal conductivity
- High bursting point
- High endurance limit
- Extra-strong
- Ductile
- Lightweight
- Machines easily
- Takes plastic coating
- Takes plating
- Shock-resistant
- No inside bead
- Uniform I.D., O.D.